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Editorials

SHOULD WE HAVE GENERAL HOSPITAL CARE FOR CURRENT TUBERCULARS?

Popular attention the last decade has been so persistently fixed on the venereal, heart and cancer menaces that the ever present, unabating prevalence and danger of active and ambulatory tuberculosis cases has been comparatively overlooked. Even professional education in tuberculosis has lagged and continued inadequate.

During this depreciation in general interest as to tuberculosis many disquieting and rather revolutionary theories have been launched and received with great indifference considering that so little stress is laid upon discrimination between open and closed cases of tuberculosis.

Even the notable authority on tuberculosis, Dr. Benjamin Goldberg, who is arguing for the admission of tubercular cases to general hospitals seems to minimize what to the average mind would be the danger line. No matter how great may be the economic stress of medicine never should science be sacrificed for the sake of economics.

Undoubtedly Dr. Goldberg agrees with this statement. However this danger line is of the maximum importance and should be emphasized whenever this question of tubercular admission to general hospitals comes up for discussion. There is much of merit in the idea, and much that merits acute scrutiny.

The tubercular patient is consigned as a rule, stock, lock and barrel to the tuberculosis specialist, and to the tuberculosis hospital or institute. Which would be marvelously competent in its ruling were it not for the fact that here again is a shining case of the confounding of practice and theory. One of the gravest perils to humanity to-day is the positive unsupervised case of tuberculosis that has slipped through the hands of the specialist in this disease, and

equally skillfully the institute or sanatorium.

For this evasion the two chief reasons are ignorance and inefficiency, and pride and poverty on the part of the patient. Only too often, too, the especial tuberculosis hospital is crowded and overflowing. Now where without any degree of danger to others the tuberculosis patient can be installed in a general hospital there would seem to be no argument against, and hundreds of arguments for, just such hospitalization, whether for bed service or merely clinical treatment as outpatients.

It is estimated that in Chicago to-day there are at least 3400 known open cases of tuberculosis with positive sputum, free and at large and without institutional supervision. To this number add the estimated 1100 or more unreported cases, without any sort of supervision that are mingling freely with Chicago's congested population and as freely spreading the dread white plague. It is not altogether impossible that this estimate is too low.

For all we know there may be even half as many again unreported cases as the one third that conservative statistics admits.

Since the maximum supervision of tuberculosis patients means the minimum of infection the necessity for supervision is obvious. Complete hospitalization would of course be the ideal treatment. While the most effective measure is hospital or sanatorium supervision, yet the incidence of infection is greatly decreased by supervision in the field.

This is well known, just as it is a known and admitted fact that every open case of tuberculosis is a manifold menace to the community. The degree of danger increases in a direct ratio with the decrease in the social scale of the patient. It has been stated by no less a tuberculosis authority than Dr. Benjamin Goldberg in his book, "The Control of Tuberculosis," that "if it were possible to give hospital supervision to every open case of tuberculosis in a community, within a decade or two we would have no tuberculosis."

If Dr. Goldberg is correct in his appraisal of the dicta of doctors of distinction in re tuberculosis then no time should be lost in getting every open case of tuberculosis under immediate field supervision if hospital supervision is not available. The question arises, too, that with all the empty beds in general hospitals why can't a few of these non-working liabilities on the institution be made to serve the best ends of humanity? *It should be borne in mind however that such tactics should never be attempted by any general hospital unless this opening of its facilities to the tubercular means ample protection from infection for the nontubercular patients in the institution.* It is unsound economics to run a hospital with vacant beds, just as it is unsound humanitarianism, but it is a crime against both principles to admit tubercular patients to any privileges by which may be increased the potentiality of their community menace.

Commenting further on Dr. Goldberg's idea: Now the reasons why, supplementing the sanitarium, the general hospital should care for the tuberculous patient are manifold and cogent.

Often the sanitarium is both crowded and with a waiting list; while the general hospital has vacant beds and as a result a consequently increased per capita cost. In other words, the hospital eats its head off while its work remains undone. It seems unsound economics to permit beds, which may be used to the great benefit of the community, to remain empty and idle.

Further it is unsound hospital management to exclude the tuberculous patient, if he can be cared for in the hospital without detriment to others or without lowering of the hospital routine standards. Empty beds are a loss; empty beds should be filled, with deficit reduction to the hospital, with economic profit to the community, and with health profit and lifesaving to the individual patient and as such to the family and the nation.

Laboratory and x-ray departments, electrocardiograph divisions and the like, in a general hospital frequently run at half capacity or even less. Yet the personnel must be maintained and paid, with obvious waste when high-salaried laboratory personnel is idle during part of the working day. To accommodate tuberculous patients in those empty beds, would increase routine business in the various laboratory divisions.

In the case of the general private hospital (presuming that admitted tuberculous patients can pay, as can many of them) this, of course will mean definitely increased revenue for the individual hospital and a thankfully decreased deficit.

The entire economic structure of the small

community is in itself a sufficient reason for the acceptance of tuberculous patients in general hospitals in thousands of towns.

Now the average small community is able usually to do one of two things—either it is able to afford and support a general hospital or to afford and support a small sanitarium commensurate with its needs.

Without inadvisable strain on its financial structure, such communities cannot adequately support both institutions at the same time.

In such small communities, where the sanitarium in itself is inadvisable or impossible, justifiable and satisfactory compromise may be made by amalgamating sanitarium and hospital functions in a well planned and well coordinated institution. Indeed such amalgamation is often called for by the humanitarian instinct which unconsciously urges man to help his fellowmen.

Public sanatoria are thronged to capacity. Each institution has a long waiting list. In the case of the Municipal Tuberculosis Sanitarium, there is a waiting list always of from four to five hundred patients.

The tuberculous individual has no place to go. He cannot get into the sanatorium. He is denied admission to the general hospital. He sees that he is becoming worse daily, and despondency accentuates the downward trend of the disease, while his lack of isolation helps in the spread of the plague. To throw open the doors of the general hospitals to tuberculous individuals, many of whom can afford to pay, is both a progressive and humanitarian step, giving hope to the hopeless, and inaugurating a health and life saving measure. Further it is first aid to self preservation and the wish to survive is in the forefront of our consciousness. Public health organizations are designed in their entirety to serve this instinct of self-preservation.

When people are conscious of a health menace, they wish to avoid it. Public health organizations when conscious of a health menace must do everything possible to minimize or eliminate that menace and every open case of tuberculosis is a potential community menace that cannot be repeated too often.

Every case of open tuberculosis, taken from the community and supervised in a hospital or sanatorium, represents definite diminution in the stream of community infection. For our own sakes, we must take care of the tuberculous individual. We can take care of him better in an institution, either hospital, sanatorium or convalescent home.

Properly cared for the tuberculous individual is not a menace to the hospital population and he can be abmitted without detriment to hospital routine or hospital patients.

Yet in every detail the tuberculous patient demands, and should receive, specialistic care.

The type of care given to tuberculous individuals in the old boarding-house type of institution is today recognized as inadequate, and characterized as neglect. The progressive sanatorium aims to give specialistic care. In attempting to reach this objective these sanatoria are lifting themselves to the plane of the general hospital. In many communities, as in many sanatoria, this phase of institutional evolution has not as yet been reached. So for such communities and such sanatoria the cooperation of the general hospital is of prime necessity. Specialistic care that cannot be furnished in the sanatorium, can be given in the hospital. Such patients as need attention and service which cannot be rendered at the sanatorium may be transferred to the hospital for the necessary treatment. The tuberculous patient in the general hospital can have the advantage of service by a competent specialistic and consultant staff. He will find available the type of service which is economically impractical except in large progressive municipal institutions in the neighborhood of big cities and this point should be considered both by small communities and by many suburbs of large cities. When the attention of the general hospitals focuses on "T.B.'s" it means fresh impetus to research in the disease.

Research in tuberculosis has been lagging. Funds available in sanatoria for research purposes are, as a rule, inadequate. In the general hospital, tuberculosis research can be linked up with general research with mutual advantage, and with mutually better prospects. The tuberculous patient in the general hospital can furnish the necessary background and clinical material; the personnel is already in the hospital and the equipment installed. The added expense involved in tuberculosis research will be insignificant in comparison with the installation of a separate research department for

tuberculosis, in any specialized tuberculosis sanatorium. Along with the research will come a greater and more ardent professional education in tuberculosis, at present also lagging and inadequate.

From the point of view of both didactic and practical work, the curriculum in most medical schools is woefully insufficient. This is because the tuberculous patient has been assigned irrevocably and exclusively to the domain of the tuberculosis specialist. He is secluded in sanatoria; is removed, and is forgotten. Yes, he is the real "forgotten man" of medicine. The amount of material available for school instruction is small and unsatisfactory. A few patients are seen by the students in the Out-Patient Department of the hospitals, or in the general school clinics. From such sources the students cannot gain even an approximate concept of tuberculosis. The situation would be far different if tuberculous patients were admitted to the general hospitals. Then in their ward walks the students would have opportunity to study "T.B." cases in detail, to watch the various phases of tuberculosis, and to gain a coherent and sequential conception of tuberculosis. The teacher of diseases of the chest would have ample material at his disposal, and would not be obliged to call upon the imagination of his students, a barren and ineffective procedure at best, and certainly not in line with modern tenets of clinical teaching.

Tuberculosis is a disease where the nursing is often half the cure, and it is a ticklish angle.

Commenting further from Dr. Goldberg, from the point of view of the nursing problem, the admission of tuberculous patients to general hospitals is advisable from several different angles, as admission of such patients would imply better general training for the student nurses. Contemporary nurses, graduated from the general hospitals today, have very little knowledge of tuberculosis nursing. Actually they do not know really how to care for the tuberculous patient. Certain features in the psychic aspect and personality of the tuberculous patient can be learned only by experience. The knowledge gained in nursing the tuberculous is valuable, and should form an important part in the final equipment of the nurse who proposes to do general work. There are a few such heroic women left—not all are specialists.

Again the tuberculous patient in the general hospital would receive better nursing care at less expense. In most large sanatoria, the number of nurses per patient is inadequate. In the general hospital, with a rotation nursing program, and with the services of student nurses available, the patient could have the benefit of a thorough routine of nursing care.

From the standpoint of diagnosis alone, the admission of tuberculous individuals to general hospitals is eminently advisable. In the early stage tuberculosis, at times, offers an almost insuperable diagnostic problem. Careful observation and study, supplemented by conscientious laboratory work over a period of time, alone will determine an accurate diagnosis. It is obviously unfair that a patient should spend this period of time (necessary for diagnosis) in a tuberculosis hospital. The patient once admitted to such an institution feels that he is branded. He is a "sanatorium case"; his friends know it, and from time to time, perhaps unconsciously, remind him of it.

For these reasons, many patients in the "doubtful column" are unwilling to enter sanatoria for "observation." Such patients, as a rule, make no difficulty about entering a general hospital. They are quite willing to spend the time necessary, submit themselves to the necessary examinations and laboratory procedures. If proved nontuberculous, they leave the institution "without stigma," as one may say. If they were proved definitely tuberculous, later, depending upon circumstances, they can be transferred to a tuberculosis institution. Most tuberculosis workers feel that an observation ward in a general hospital is a distinct advantage to the patient, to the profession and to the community.

Installation of a tuberculosis department in a general hospital tends towards concentration of tuberculous individuals in one section. Today many hospitals accept tuberculous patients notwithstanding their avowal that they refuse to accept such cases. They accept them, in most instances, unconsciously. They come in under erroneous diagnoses and are allowed to remain in the wards, sometimes over a prolonged period. Sometimes, as the diagnosis is made, it is difficult to have the patient immediately removed; usually, however, the cases remain unrecognized owing to the fact that the staff is

not on the alert for the insidious forms of tuberculosis, and owing to the lack of facilities for consultation. This condition would not hold if an energetic tuberculosis division were operative in the same hospital building. Such a division, as part of its function, would exercise supervision throughout the institution, weed out the tuberculous individuals from the general ward, and place them where they could have correct tuberculosis supervision.

"Now is there any reason why the general hospital *should not* care for the tuberculous patient?" asks Dr. Goldberg. In answering his question he continues, *"There is no reason, granted proper conditions and proper management, why the tuberculous patient cannot be cared for in the hospital.* Under improper conditions and poor management, *such a course is definitely inadvisable,* and even dangerous. No one will advocate the admission of open cases of tuberculosis to the promiscuous and rather crowded environment of the large general ward. Patients debilitated from other chronic conditions should not be subjected to the possibility of a tuberculous infection. *This possibility must be absolutely and finally ruled out before we can even dare to consider the proposition.* Yet suitable arrangement and conscientious supervision and management, will eliminate even a remote possibility of house infection.

In a broad way, and from the long distance standpoint, any tuberculous individual might be properly treated in a modern general hospital. Certain types of cases, however, are more in need of hospital treatment than others. A short survey of this phase of the matter may be of interest.

Hospital treatment is at times specially indicated for

The Suspect Case. The advisability of a brief period of hospital stay, tending to confirm or eliminate a diagnosis of tuberculosis, is apparent.

The Case for Whom One or Other of the Various Surgical Procedures is indicated. In the future, perhaps, patients needing thoracoplasty and phrenectomy will be cared for in the general hospitals. In cases such as these the expensive operating room equipment must be considered as duplication even in the case of large institutions. Better cooperation between the hospital and sanatorium tends largely towards eliminating expense. A patient in need of surgical treatment for tuberculosis may return to his home after a brief period of hospital residence. This procedure will release a bed in the sanatorium for a patient who may be badly in need of sanatorium routine.

The Patient Who Awaits Admission to an Institution is One for Whom Segregation is Indicated, particularly, in the open case in contact with children. In order to protect the children this patient should leave his home. It is only fair that the community which compels him to give up his home and family life, should provide him with a place to stay until such time as he may be admitted to the sanatorium.

Then there is *The Patient for Whom no Sanatorium Facilities are Available.*—In some communities, there are no sanatorium accommodations. In such communities, it is only reasonable to advocate that a wing for the care of tuberculosis be added to the general hospital.

The day of institutional isolation is past. Today the tendency is toward cooperation and coordination of all institutional facilities in the specific community.

WITH APOLOGIES TO DOCTOR WESSEL

In the July Journal, page 13, proceedings of the House of Delegates of the Illinois State Medical Society, the resolution "fees for surgical services as rendered at state institutions" was wrongly credited to Dr. W. F. Schroeder, Rock Island. The authorship of this resolution as well as its introduction into the House of Delegates belongs to Doctor Perry H. Wessel, of Moline.

EFFICACY OF QUINIDINE IN MALARIA

J. P. Sanders, Caspiana, La., and W. T. Dawson, Galveston, Texas (*Journal A. M. A.*, Nov. 19, 1932), confirm the antimalarial efficacy of quinidine. Trial of the drug in total of fifty-seven cases of malaria with positive smears in a country practice in Louisiana in 1930 and 1931 has revealed no inferiority to quinine. Of these cases, thirty-three were benign tertian and twenty-four estivo-autumnal. A 10 grain dose (0.65 Gm.) of quinidine sulphate once daily about three hours before chill time rapidly removed the acute dangers of malarial fever in all cases. The same dose once daily for four days was effective and did no harm in two pregnant patients. Quinidine is recommended for trial as a quinine substitute in cases of asthmatic, coryzal or urticarial reaction to quinine, or in cases of malaria in which the response to quinine is poor.

WITNESS WHAT FREE MEDICINE HAS DONE IN DETROIT, WHERE AS IN OTHER PARTS OF THE STATE OF MICHIGAN THERE HAS BEEN MUCH MEDICAL ECONOMIC EXPERIMENT.

Doctor, consider this. Banker, stop and ponder. Merchants, what if you dealt in medicine?

If you can get your body made well and physically pliable for nothing, why can't you get shelter for that body, food to nourish it, and clothes to cover it for the same paltry price?

In other words, *free medical service,* handed out indiscriminately and by *social workers* whose generosity emanates from *taxes* or *levies* upon other persons' pockets instead of their own, is the first and longest stride towards the *devastation by dole.*

After free food, one of the first free items of life for which the communist howls is a free doctor.

Every doctor in the land should witness what "free medicine" has done in Detroit, where as in other parts of the state of Michigan there has been much medical economic experiment.

Reliable figures secured in Detroit show that: Nearly three years ago a summary of the facts demonstrated that 50 per cent of the medical cases in the community were being cared for at the expense of the taxpayer. The clinics supported from charitable donations gave clinic and dispensary out-patient service to 77,183 sufferers, real and imaginary; and these treatments included 330,507 calls. On top of this, the Detroit Department of Health, directly tax-supported, treated 77,794 patients, including 251,838 calls; and at Receiving Hospital, also directly tax-supported, there were 18,461 patients and 82,184 calls. These mounted to a literally grand total of 171,136 patients and 670,088 calls! *About half of the medical cases treated in metropolitan Detroit in 1928 were looked after by clinics maintained by charitable funds, supported by tax-payers, and by tax-supported clinics.* The condition has grown with the dole. It will grow still further, until it becomes obviously intolerable. And then, change will be too late.

Dr. J. Milton Robb, President-elect of the Michigan State Medical Society, declares that unless this medical dole is stopped, the dole for every detail in life is more imminent than is dreamed of by the average citizen, and hundreds of doctors with vision concur most heartily in this opinion.

There is no doubt but that free medical and hospital care is a great developer of an attitude of pauperization. Sympathy for the humanities has made of charity the camel within the tent.

Often patients who are on the town go into hospitals for any minor illness and finally manage to have everything from major operations down performed on them at somebody's else expense before leaving the hospital.

Dr. Robb writes feelingly. He says in part:

"Medical service is a commodity, worth money. The doctor is exempt from none of the expenses of living and bears some that are inherent in his profession. Rent, equipment and medicines all cost him money, to say nothing of the fact that he is obliged by the nature of his calling to live according to certain standards that are also expensive.

"We have the spectacle of institutions erected with the proviso that the donor will put up the building if someone else—the taxpayer—will equip and operate it. If some of these institutions were more nearly actual 'monuments,' so built that no one could by any possibility get into them, the world would be just that much better off. Philanthropists would do well to consult medical experts on design and equipment, whether the donor or someone else is to pay for them or part of them.

"Plenty of our Detroit patients balk at the idea of being made 'paupers' in connection with their medical treatment and surroundings. The only respect in which they are willing to be paupers is that they decline to pay for what they get. The surroundings are oftener than not so far ahead of the homes from which some of the impostors come that it is little wonder that they prefer the hospital to the home. The percentage of bath-tubs, though almost always unused, is considerably higher in the hospital. Honestly, patients on charity want better conditions than I would dare to ask for members of my own family. A Rolls-Royce type of treatment is insisted upon by men who could only afford a bicycle if they had to pay for it themselves.

"Maternity cases, one would think, might come under a different category. Not at all. They form one of the most aggravated forms of abuse of philanthropy. One woman on record holds the trophy with 23 births and the end is not yet. Her outspoken philosophy is: 'Someone's got to take care of it; I can't.' Maternity treatments are free to the irresponsible or the vicious mother—but how about the taxpayer? Less easy money, in the form of free care, might help reduce the birth rate of undesirables. This is not a hard-boiled statement, it is nothing but the application of common sense to a condition that has already reached the point of intoleration."

"As at present constituted, the existence of free medical treatment strikes at the very foundations of the nation. It is not alone that the money of the taxpaying citizen is being wantonly wasted. That is bad enough, in all conscience. But deeper and more perilous is the fact that it heads the people of the United States to a general condition of pauperism in their attitude to life. The free medical dole is only the beginning. It leads inevitably to the general and all-embracing dole, in which the self-respect withers and the sense of shame disappears.

"From a familiar experience with conditions as they exist, it can only be said that the present system of free medical treatment and attendance constitutes a menace, the seriousness of which it would be difficult, if not impossible, to over-estimate."

What applies to Detroit applies to every community in the land. The parasites, thanks to misguided philanthropy, spend more of the taxpayers' monies than the taxpayers spend on themselves. Unless this tendency is stopped the certain revolt will be chaotic and uncheckable.

Doctor, don't lend your help to "Free Medicine" as communism's flagbearer.

NO TWO COUNTRIES USE THE SAME YARDSTICK IN MEASURING MATERNAL MORTALITY STATISTICS.

Maternal mortality is a never ending point of argument and probably will hold interest so long as human beings are born and die.

It is unfair though for proponents of state medicine to keep harping on the premise that is as false as it is frequent that the United States is afflicted with the highest maternal mortality figures in the world. This is not true. In the first place there is no common denominator or basic formula of statistics that enables a proper comparison of maternal mortality statistics between any two countries in the world. Until some clearing house for statistical rules is evolved the matter stands to be as vexatiously problematical as "How old is Ann?" or "Which comes first, the chicken or the egg?"

Sane statisticians realize this, let the socialists rave as they may.

In his International Studies on the Relation Between the Private and Official Practice of Medicine, Sir Arthur Newsholme points out that international comparisons are not dependable because of the great variation that exists in different countries. "In developing such statistics it is possible to discover considerable differences in puerperal death rates which do not correspond with real differences. The practices in England and Scotland do not differ markedly, but those in the Netherlands and in the United States differ greatly from those in England and Scotland. The international position is somewhat chaotic and it is doubtful whether the chaos could be removed by the adoption of a rigid and detailed international system of rules, since so much is depending on the personal bias of the statistician responsible for relegating a dubious certificate embodying more than one item to its right compartment."

Dr. Robert J. Lowrie indicates "the serious character of the difficulty of properly evaluating death certificates involving puerperal mortality in this country. Not every death certificate on which there is mention of pregnancy or childbirth can count as a maternal death, because pregnancy and childbirth are frequently complicated by cardiac disease, hyperthyroidism, tuberculosis, syphilis and similar complications. Reports of cases are available in which a fever appearing post partum was associated with the appearance of congestion of the lungs in a patient with a long history of tuberculosis. The question as to whether the fever was due to puerperal sepsis, pneumonia or recurrent manifestations of tuberculosis involved a decision too delicate to be shown adequately on the death certificate.

"Our present method of determining maternal mortality rates is quite inaccurate and I

beg to offer a new system which is of interest.

"In this the analysis of the technic involved is a matter for biometricians. Impossibility of accurate comparisons between maternal mortality rates in various countries, in individual communities in the same country, in hospitals and in general practice is evident. Proper prenatal care and adequate obstetric care will lower greatly the mortality and morbidity rates in any group."

For the time being at least it would seem better to devote ourselves to results rather than to statistics.

THE EFFECT THE NEW SALES TAX LAW WILL HAVE UPON PHYSICIANS.

A large number of inquiries have been directed to THE JOURNAL office as to what effect, if any, the new retailers "Occupation Tax," more familiarly known as the "Sales Tax," will have upon physicians.

We are in receipt of the rules and regulations issued by the Department of Finance of the State of Illinois. Special Rule 19 would make it appear that physicians prescribing their own drugs would be subject to making a return under the retailers occupation tax act.

We quote Special Rule No. 19 in full:

SPECIAL RULE NO. 19

PROFESSIONS, INCLUDING OPTICIANS AND OPTOMETRISTS, PHYSICIANS, DENTISTS, ARCHITECTS, ARTISTS AND VETERINARIANS

Persons engaged in the professions of and known as opticians and optometrists, physicians, dentists, architects, artists and veterinarians are included in the provision of Article 6 of the General Rules and Regulations issued by this Department. They render service. Sales *to* such persons of such tangible personal property as they may use or consume incidentally to the rendering of such services are "sales at retail," within the meaning of the Act.

Where members of these professions enumerated above, sell tangible personal property to purchaser for use, they come within the Act as to such sales.

CONVALESCENT POLIOMYELITIS SERUM IS AVAILABLE

The State Director of Public Health calls attention of the medical profession to the fact that convalescent serum for treating pre-paralytic cases of poliomyelitis is available upon request of physicians from the State Department of Public Health. Due to the fact that it is difficult to obtain this serum in quantity physicians are requested to ask for serum only for immediate use. The available supply is too limited to undertake to provide physicians with serum for anticipated requirements.

While the value of convalescent serum has been questioned lately by physicians whose opinions are worthy of respect, all of the experience in this State has been favorable and it appears to be the general practice among the more progressive physicians and health officers to use the serum in indicated cases.

Arrangements have been made to receive and give prompt attention to requests for serum at any hour of the day or night throughout the poliomyelitis season.

Recently the prevalence of the disease has manifested a strong upward tendency. While as yet there are no indications of outbreaks of large magnitude it is highly probable that the next six or eight weeks will bring a substantial number of cases that may affect 100 or more persons.

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FREE EXAMINATIONS FOR TUBERCULOSIS AT STATE FAIR

The Sangamon County Medical Society and the State Department of Public Health have arranged to make free tuberculin tests and X-ray examinations on a limited number of children at the Illinois State Fair, August 19-26. This project is undertaken as a demonstration in the use and value of the Mantoux skin test and the X-ray in the early diagnosis of tuberculosis.

Children between 5 and 16 years old, whose parents or guardians so request, will be accepted for the test and the examination. Children brought to the fair for the test will be pro-

vided with admission tickets to the fair grounds and asked to return two days later for a reading of the test. It is the plan to immediately take X-ray pictures of those with positive tests. It it to be emphasized particularly that a positive test does not necessarily mean active tuberculosis.

Physicians of the State are invited to send to the fair any of their patients whom they wish tested and examined.

EVERY ONE IS PRESCRIBING

A. E. H., in the Journal Lancet, July 15, makes the following timely comment:

Physicians themselves are to blame in a certain measure for the innumerable persons practicing medicine.

Technicians of various kinds, nurses, druggists, barbers, beauticians, athletic directors and shoe clerks are practicing medicine. At social functions, every day, advice is given and prescriptions are passed around by lay persons, even in the presence of members of the profession—everyone is practicing medicine. And how they delight in telling about it!

Large and successful industrial corporations, banks, institutions of learning and public utility companies have organized "health services" and "welfare departments" wherein employees and students receive actual medical care at any time they apply whether a physician is present or not. In some cases its humble beginning is a "rest room" presided over by a pay-toilet-qualification attendant who carries aromatic spirits of ammonia, aspirin, sal hepatica, unguentine, iodine and bandages as an interesting and ever increasing sideline. Then along comes a case of asphyxiation and contact is made with the resuscitation squad of the fire department and so on and on without interference.

Physicians are to blame for their attitude of tolerance. Proper allowance should be made for emergencies, but surely much of this is neither necessary nor right and the question properly arises if and to what extent the profession should tolerate this condition. Moving picture operators are not imposed upon in like manner. A profession committed to free services for those who cannot pay should first of all be able to distinguish between charity and imposition.

Correspondence

HAVE YOU INSTRUMENTS OR OTHER ARTICLES THAT HAVE A MEDICAL HISTORICAL BACKGROUND?

July 25, 1933.

To the Editor: The enclosed letter was received from a prominent citizen in Petersburg, Illinois, and it seems to me that it would be a fine thing to publish it in the Journal, asking that any physicians who have any instruments or other contributions that have a historical background, who would be willing to loan them to the Allen cottage at New Salem, to get in communication with either Mr. Frackelton, at Petersburg, or myself.

It may be of interest to know that the State of Illinois is going to considerable expense in rehabilitating New Salem so that it will be as nearly as possible the same as when Abraham Lincoln lived there. Thousands of tourists a year visit this interesting place, and I am quite sure that the medical profession of the State will aid in any way they can to make it an additional point of attraction.

Yours very truly
J. R. NEAL, M.D.,
Chairman Legislative Committee.

The following is the letter sent to Dr. Neal:

July 18, 1933.

Dr. John R. Neal,
President of the Illinois State Medical Society,
Springfield, Illinois.

Dear Doctor:

Among the cottages to be furnished in the restored village of New Salem are those which were occupied by Doctors John Allen and Reignier. Doctor Allen married a sister of Dr. Charles Chandler, who laid out the village of Chandlerville and after whom it was named.

The Allen cottage at New Salem was among the more pretentious in that small community and consisted of three log rooms with a large fireplace. There was a small bedroom, a living room and a room Dr. Allen used for his office. These rooms are to be furnished with appropriate things such as were in use one hundred years ago, and suitable things are being sought wherever they can be found. Any contribution will have its history and the name of the donor

attached to the gift and will be kept under lock and key and shown to visitors only when accompanied by an authorized guide. Any family heirlooms of that period will thus be kept with more care than possibly they have now. They will preserve the name of the donor and the history of the gift, at the same time helping this and succeeding generations to visualize the home surroundings of Abraham Lincoln and his neighbors at New Salem.

It has been suggested that among the doctors of Illinois, there may be found instruments, books, medicine containers, office fixtures and furniture dating back to that time, with which they would like to help furnish an office formerly occupied by an honored and successful man of their own profession, whose influence upon young Lincoln is said to have been very helpful.

A grandson of Dr. Charles Chandler, C. C. Frackelton of Petersburg, Illinois, is Chairman of a Committee having in charge the furnishing of the Dr. Allen cottage and would be glad to correspond with anyone wishing to donate any suitable article for this purpose.

I am writing this letter to you at the suggestion of Dr. Elmer E. Hagler, with whom I had some conversation and who thought the appeal would meet with a ready response from the members of your association.

Yours truly,
C. C. FRACKELTON.

THE CURABILITY OF DERMATITIS REPENS

Chicago, Ill., July 5, 1933.

To the Editor: In the ILLINOIS MEDICAL JOURNAL of July, 1933, on Page 59 a doctor in referring to my paper on "Dermatitis Repens" (Ill. Med. Journal, May, 1933) states that he "cures this trouble in one sitting." His treatment consists in snipping off the raised epidermis with sharp curved scissors and in applying a wet boric acid dressing for 48 hours over the denuded area, and this in most cases cures the whole thing.

It seems to me that the doctor has a wrong conception of the pathology and clinical course of dermatitis repens. A review of the Literature on the subject will convince him that his treatment has been tried and failed and even amputations of the toes or fingers failed to stop the eruption. In fact a number of dermatologists are of the opinion that dermatitis repens is never cured.

I was reluctant to call even my case dermatitis repens, but since the affection was of six years duration, and had persisted in spite of all forms of therapy including snipping of the loose epidermis at the edges and boric acid fomentations, and since a number of competent dermatologists agreed with my diagnosis I was emboldened to report my case.

What the doctor calls dermatitis repens is undoubtedly a ringworm infection or some other superficial bacterial vesicopustular infection. A more careful rereading of the literature especially the excellent paper by Barber and Eyre (Brit. Journ. Derm. 39:485, 1927) will convince the doctor that what he calls dermatitis repens is some other condition, and that he probably was fortunate enough not to have come across in his practice a true case of dermatitis repens.

S. J. ZAKON, M.D.,
185 N. Wabash.

THOSE WHO HAVE CONTRIBUTED TO THE SUPPORT OF HOSPITALS ARE APPRECIATING MORE THAN THEY HAVE IN THE PAST THE VERY SERIOUS ECONOMIC PLIGHT IN WHICH OUR HOSPITALS FIND THEMSELVES

AMERICAN HOSPITAL ASSOCIATION
CHICAGO, ILL.

July 12, 1933.

To the Editor: I want to particularly express my appreciation, and in this I speak for a very large portion of the hospital field, of your editorial in the July issue of the ILLINOIS MEDICAL JOURNAL, on hospitals. As a matter of fact not only hospital people but those who have contributed to the support of hospitals are appreciating more than they have in the past the very serious economic plight in which our hospitals find themselves. The interests of our hospitals and of the medical profession closely parallel each other and it is both stimulating and

encouraging to know the attitude of the best minds of the medical profession toward the hospitals.

The American Hospital Association has taken and held a very steadfast position in its efforts to maintain our institutions upon a very high plane of professional efficiency and ethical concepts. Perhaps more than the medical profession, our hospitals have to battle against the intrusion of those practices into our hospitals which both our institutions and the medical profession condemn. They have to fight constantly the evils that attend commercialized free clinics and even the attitude of some of our recognized medical schools and hospitals, particularly in the vicinity of Chicago, that continue policies as inimical to good hospital care as they are to good medical performance.

There seems to be little doubt but that as a whole the country is over-hospitalized, and with 200,000 hospital beds constantly vacant, 145,000 of which are in our voluntary hospitals, we are now witnessing the insistent demands of hundreds of communities for funds, through the N. I. R. A., to help in the construction of *new hospitals to be tax-built and tax-supported,* to provide free care, both hospital and medical, for a larger number of people, many of whom could provide, if they were provident, sufficient funds to pay at least the cost of their medical service to the physician and their hospital care to the institution.

If permitted to run unopposed these requests, if granted, will produce a situation similar to and perhaps more critical in its dissipation of public funds unwisely and unnecessarily than the unlimited building of government hospitals for the care of the veterans, until it was brought to a halt.

The American Hospital Association has sent the attached telegram to President Roosevelt, Miss Perkins, Secretary of Labor; Mr. Ickes, Secretary of the Interior; Hon. William Green, president of the American Federation of Labor; Hon. Louis Douglas, Director of the Budget; Gen. Hugh S. Johnson, administrator of the Federal Emergency Act; Col. Donald H. Sawyer, and Admiral Richard Byrd, chairman of the National Economy League. For the past two days we have had a committee in Washington composed of Drs. F. A. Washburn, N. W. Faxon, A. J. Lomas, S. S. Goldwater, Hon. R. P. Borden, and Fathers Griffin and Schwitalla, presenting our arguments in opposition to the wholesale distribution of funds for the erection of new hospital facilities.

Again permit me to thank you for your fine editorial in the July issue of THE JOURNAL.

BERT W. CALDWELL, M.D.,
Executive Secretary.

COPY OF TELEGRAM

The American Hospital Association, representing through its institutional and personal membership voluntary and tax-supported hospitals with 600,000 beds, regards the efforts that are being made to obtain large Federal grants to support extensive programs for the construction of municipal and county hospitals as a serious threat to the future of the voluntary hospital system.

There are at present 65,000 vacant beds in government owned hospitals and 145,000 vacant beds in our voluntary hospitals. These vacant beds are sufficient to take care of the peak load of patients to be hospitalized if the load were evenly distributed.

The construction of new hospitals and their operation, would create a new and permanent tax burden upon communities already provided with ample hospital facilities. The permanent addition of this load to local tax requirements is unwarranted and unwise.

If the many thousands of patients normally employed at modest wages and normally cared for in voluntary hospitals are to be provided for in new buildings erected by tax-supported hospitals, assisted by Federal grants, these patients will probably remain charity patients permanently even when remuneratively employed.

The wise course for the Federal Government in the present emergency is to restore the old balance between voluntary and public hospitals, and instead of creating new tax burdens upon communities by providing Federal grants, for new hospital constructions, to utilize the 210,000 vacant hospital beds by placing emergency funds at the disposal of both voluntary and tax-supported hospitals, to defray all or a part of the unusual demands for free care of the indigent and unemployed sick, which demands are of a temporary nature.

The great mass of intelligent workers does not want to be forced to accept permanent classification as indigent sick, and to be cared for at the public expense as paupers.

The American Hospital Association urges Federal authorities, States, Counties, and Cities, medical associations, and organized labor to adopt this principle and to discourage additions to public hospitals which will not be permanently utilized or required unless many existing voluntary hospitals are eventually abandoned.

Night letter July 12 to:

President Franklin D. Roosevelt
Hon. Wm. Green, President, American Federation of Labor
Miss Frances Perkins, Secretary of Labor
Hon. Harold L. Ickes, Secretary of Interior

Gen. Hugh S. Johnson, Administrator Federal Emergency Act
Hon. Louis W. Douglas, Director of Budget
Col. Donald H. Sawyer, Department of Interior
Admiral Richard Byrd, Chairman National Economy League

WHY MANY HOSPITALS ARE ONLY PARTLY OCCUPIED AND ARE FINANCIALLY BROKE OR NEAR BROKE HAS NOT BEEN EMPHASIZED

Chicago, Ill., July 12, 1933.

To the Editor: Permit me to congratulate you upon the several special "editorials" in the July number of the ILLINOIS MEDICAL JOURNAL, particularly the one dealing with the seriousness of the situation confronting hospitals.

Each issue of THE JOURNAL carries valuable and pointed articles from your pen, but it seems to me that the recent July number has contributions of greater than usual timeliness and importance. We members, indeed, are indebted to your unselfish and vigorous fighting of our social, ethical and economic battles. Doubtless many physicians do write you, but my added words will do no harm.

It appears to me that one phase of why many hospitals are running about thirty per cent occupied and, financially, are "broke" or "near-broke" has not been emphasized.

With very few exceptions, our hospitals in Chicago and throughout the state are so chartered that they *may not refuse the admittance of any non-contagious patient, sent in by any reputable, licensed practitioner of medicine.*

In theory this is proper but in practice it does not work. In Chicago, the majority of hospitals have "staffs," organized more or less for efficient intra-mural work, but very efficiently organized to "protect their lairs." So, even though these hospitals may be occupied but thirty (or less) per cent by paying patients, through the influence of the "staffs," time after time and day after day, the business offices turn away patients proffered by men of repute and ability.

Patients, not rarely, suggest to their physicians that they would like them to treat them in such-and-such institutions, yet, if their physicians be not on the "select list" of those hospitals, the patients must be urged to go elsewhere or, if they persist in their desires to go to the hospitals of their choices, then their own physicians may not have them admitted or treat them there. The same patients readily are admitted to the hospitals in question if the patients' regular physicians transfer them to the so-called "staff" physicians!

Such attitudes of hospitals and their "staffs" rob hospitals of patients, foster hospital staff chauvinism and, besides being illegal, unfair, unethical and unsportsmanlike to reputable physicians, not uncommonly injure the reputations of those physicians: patients are apt to draw conclusions that if their own, regular medical attendants may not treat them in the hospitals which they, themselves, select, then their physicians are below standard. And yet, in those same hospitals may be practicing men who have been assistants or pupils of the physicians discriminated against or men who have very little background, socially, professionally or ethically.

One day a "test case" of this discriminating practice of hospital "staffs"—it's not the business office which is to blame—will arise and when it does, there will be a real rumpus in the hospital situation in Chicago.

FRANK SMITHIES, M.D.

AESCULAPIAN SYMBOL OBSOLETE

Inglewood, Calif., July 1, 1933.

To the Editor: The Symbol of Aesculapias, the so-called insignia of the medical profession, dates back in its origin to the "Age of Fables." Mythology claims it as one of the emanations of the fertile imaginations of the fictionists of ancient pagan Greece.

It is related in these ancient fables that one Aesculapias, the god of medicine, carried a staff or rod around which was entwined a serpent, hence the "insignia" of the medical profession. It is also related that Hermes (Mercury) who was a brother of Apollo (the father of the great, mythical physician, Aesculapias) and who was the messenger of the gods, also carried a rod around which was entwined two serpents. This "Wand of Mercury" or "Caduceus" as it was called, is sometimes erroneously used as the insignia of the medical profession.

Just what relation the "Symbol of Aesculapias" and "The Wand of Mercury" bear to each other, or just what the significance of the rod and the serpent was, is not within the prov-

ince of this article to attempt to explain. Suffice it to say that if the Aesculapian symbol ever did in any way symbolize the ideas and ideals of the medical profession, then, that day has long since passed.

Exactly what there is about a loathsome reptile, with its body coiled ready to spring and its poisonous fangs bared ready to strike, that is in the least symbolic of modern scientific medicine, utterly beggars the most acute imagination. Indeed, if it is not the very antithesis of every idea and ideal associated with modern scientific medicine—then—well, then, things "Ain't what they seem" and it is perfectly allowable to teach the "Risin' generation" that "There ain't no sech thing as evolution." As well symbolize the American Red Cross by a scorpion, or represent, symbolically, the Christian religion by a porcupine.

The economic stupidity of the medical profession, its unmurmuring willingness to bear the burdens of humanity, and its stubborn resistance to clearly indicated changes might well be symbolized by a donkey. Too, its lack of ability and willingness to organize and fight for its legal, social, and economic rights, could be aptly represented by the bobbing cottontails of a bevy of rapidly departing frightened rabbits, but to attribute any of the qualities or qualifications of modern scientific medicine to a slimy, poisonous snake, with its clammy, repulsive body entwined about a meaningless stick, is too utterly and absolutely ridiculous for words to express.

The fact that many physicians do not even know the name of this so-called insignia; the fact that few physicians have any knowledge of or care anything about the origin or significance of this emblem; the fact that it is a rare thing, indeed, for a member of our profession to use it on his literature or his name-plate; and the fact that "Trade Journals" only use it to identify them with the medical profession, is ample proof that it is not a true or desirable emblem to symbolize modern scientific medicine.

Modern scientific medicine has reached that place in its development when if it is to attain to that usefulness of which it is capable—*two things must happen.* First—It must consolidate and become that fraternity, in reality, which it is now commonly supposed to be but which it is not, and—Second—It must be identified in the minds of the laity as a separate, distinct entity in contradistinction to those hangers-on of the healing art variously known as quacks, irregulars and pseudo-practitioners.

These two objects can be attained if the medical profession will adopt a suitable insignia, sign or emblem that is truly symbolic of its scientific ability, its high ideals and its noble calling. Every physician would then exhibit it on his car, on his literature, and on his name-plate; every medical magazine would feature it on its front page as a matter of course; and every layman would soon know—for the first time—whether he was calling on or calling up a doctor of scientific medicine or an ordinary quack.

This represents the greatest and most important forward step that modern scientific medicine could possibly take at this time.

To this end, therefore, I propose and urge that a liberal monetary prize be awarded for a suitable emblem that most accurately symbolizes modern scientific medicine. The expense in this connection could, most likely, be taken care of by philanthropy, but a small per capita tax on the members of the medical profession would seem more in keeping with the spirit that would be manifest in a movement of this kind. The officers of the American Medical Association could sponsor it and a committee that they would appoint could act as the final judge in the contest.

The psychology of an emblem to symbolize the ideas, ideals and activities of a fraternity, society or organization is well founded. Nearly every group in our country, from the most insignificant to the most powerful, has its sign or insignia which its members are proud to display and which serves to consolidate and identify its membership, but the great, modern, humanitarian, scientific, medical fraternity has *none.* We are a fraternity without a symbol; an army without a banner; a *nation without a flag.*

E. H. CRANE, M.D.

"My dear," called a wife to her husband in the next room, "what are you opening that can with?"

"Why," he said, "with a can-opener. What do you think I was doing with it?"

"Well," replied his wife, "I thought from your remarks that you were opening it with a prayer."

CHANGE OF NAME OF THE MEDICAL WOMAN'S JOURNAL

June 28, 1933.

With the June issue The Medical Woman's Journal became *"The Medical and Professional Woman's Journal."* The scope of its activities has been broadened to include the work of scientific women in allied fields. This step was taken after due deliberation and in accordance with the avowed aims of this publication, over a period of forty years.

During four decades the Journal has recorded the work of medical women throughout the world and from now on will endeavor to present the outstanding achievements, not only of women physicians but dietitians, dentists and women engaged in public health, all working towards the common end of health, happiness and welfare of women and children in these fields in which women are so well fitted to make noteworthy contributions.

With the June issue the Journal has been enlarged to 64 pages and cover, with a new design for same, a new dress of type, new department heads, and a most attractive make-up. The management points with pride to expansion at a time when many publications are struggling for existence; this expansion has been possible because of the loyal and continued support of medical women. The Journal has in the past been the only scientific monthly publication issued in the interests of women physicians throughout the world, so this enlarged publication will be, so far as the management knows, the only magazine reaching all these professional women under one cover.

INTO THE DISCARD

On the final day of its Session the Fifty-Eighth General Assembly swept into the legislative discard among others, the following bills:

SB 457—Osteopathic Practice Act
SB 458—Establishing a separate Osteopathic Examining Board
SB 542—Establishing a separate Examining Board for Naturopaths
SB 543—Naturopathic Practice Act
SB 566—Providing for a Special Examining Board for Physiotherapy Practitioners
SB 567—Providing for the Licensing of Physiotherapy Practitioners
HB 784—Chiropractic Practice Act
HB 785—Providing for a Special Examining Board for Chiropractors
HB 842—Osteopathic Practice Act
HB 843—Establishing Separate Examining Board

The Legislative Committee takes this opportunity to congratulate the members of the Chicago Medical Society and the Illinois State Medical Society on this result.

The Committee also thanks the members for their enthusiastic support in response to the frequent calls for concerted action.

"If it can be done in legislation, it can be done in economic protection."

THOMAS P. FOLEY, Chairman,
Legislative Committee.

C.M.S.B. 7-22-33

MEDICO-MILITARY COURSE FOR MEDICAL DEPARTMENT RESERVE OFFICERS

The medico-military course of inactive duty training for Medical Department Reserve officers, which has been held at the Mayo clinic during the past four years, will again be held this year from October 1 to 14, both dates inclusive. This inactive duty training will follow the plan so well worked out under the auspices of Colonel George A. Skinner and the military features will be under his personal supervision.

This type of military medical training is now well established and has proved its worth during the past four years. The course offers valuable and interesting training for the Medical Department officers of all the components of our national defense. The staff and faculty of the Mayo Clinic have again placed their unexcelled facilities at the service of their government in the interest of preparedness, and have extended an invitation to all the services to participate.

This short course is equally applicable to general practitioners and specialists. The morning hours are devoted to purely professional subjects selected by the student officers. The afternoon hours pertain solely to medico-military subjects and the evening hours are covered in a lyceum course of general interest.

Application for this course of inactive duty training should be made to the Corps Area Surgeon, Seventh Corps Area, Omaha, Nebraska.

Applications should state the character of the work the candidate desires to follow in the morning hours. All student officers are expected to attend and participate in the afternoon and evening sessions. Each applicant should fully understand that the invitation to accept this course of study without charge is extended by the Mayo Clinic; that the project is without expense to the Government; and that one hundred hours' credit will be given those who take and complete the course. While it is desirable to attend the entire course, those whose time will not permit this may join or leave at any time and will receive credit for the hours spent in training. Uniforms are optional.

SUGGESTED TOPICS FOR TALKS TO BE GIVEN BY MEMBERS OF THE ILLINOIS STATE MEDICAL SOCIETY BEFORE LAY GROUPS—1933-34

MEN'S CLUBS:

1. Checking Up Your Body's Assets—"The importance of periodic physical examination."
2. The Business Man and his Stomach
3. Health Problems in Illinois
4. Some Health Problems Of The Middle Years—"A discussion of the diseases that endanger middle life, as well as of the general health habits to be followed at this time in regard to food, exercise, recreation, rest, etc."
5. How To Be a Great Grandfather
6. Animal Experimentation in Relation to Human Welfare
7. What Everyone Should Know About Cancer
8. Mind Health
9. Why Die So Young
10. Health and the Depression
11. The X-Ray, Searchlight of Medicine
12. Your Heart
13. Science and Superstition
14. Why Men Break Down between Forty and Fifty-five
15. Your Blood Pressure and Your Business
16. Venereal Infections
17. Prostatic Problems

WOMEN'S CLUBS AND PARENT TEACHER ASSOCIATIONS

1. Health Problems in Illinois
2. The Hopeful Side of the Cancer Problem—"A discussion of the nature of cancer and an account of the latest knowledge on the subject."
3. Keeping Fit for Club Work
4. Sound Body—Sane Mind—"A discussion of the intimate relation between muscle and nerve and the necessity for recreational and diversional activities and interests as a counteractant to the intensity of modern life."
5. Growing Old Gracefully—"As women reach middle age, sundry health problems confront them. Cancer, high blood pressure, nephritis, and heart disease need to be guarded against, and the less serious conditions such as excessive weight and the nervous adjustments necessary at this time, should receive attention."
6. Before the Baby Comes
7. Children and the Movies
8. Child Behavior Problems
9. The Relation of Health to School Work
10. Keeping Children's Diseases Away from your Children—"A discussion for mothers on how to keep their children well, including food, sleep, clothing, fresh air, cleanliness, etc."
11. The Difficult Problem of Growing Up—"Preparing the child for adolescence."
12. Health and Personality
13. How Medical Science Protects the Child
14. Men and Microbes
15. Health and The Depression—"Nutrition and Malnutrition."
16. Leisure Time or Recreation and Health
17. The Parent and Child Relationship
18. The Problem of the Crippled and Handicapped Child
19. X-Ray, The Searchlight of Medicine
20. Relation of Delinquency and Crime to Education
21. Child Guidance and Mental Hygiene
22. Contagious Diseases and Quarantine

HIGH SCHOOL ASSEMBLIES

1. The Story of X-Ray and Radium (Illustrated)
2. Health and Happiness
3. Heroes of Medicine
4. The Animals' Gift to Mankind
5. The Choice of a Career
6. Control Yourself
7. Ignorance, Accidents and Health
8. Mental and Physical Preparations for a Career
9. What Are Bacteria?
10. Temperance—"Not from the standpoint of alcohol or tobacco, but excess in any line as a health menace"

Request Speakers through the office of the Educational Committee, Illinois State Medical Society, 185 N. Wabash Avenue, Chicago, Ill. Telephone State 4415.

PACKAGE LIBRARIES

Libraries on the following subjects are available in the office of the Educational Committee, Illinois State Medical Society, 185 N. Wabash Avenue, Chicago.

Adolescence—Youth—Leisure Time
The Adolescent
Alcohol and Health
Animal Experimentation
The Baby
Behavior and Health
Birth Control
Blindness
The Blood
The Business Man and His Stomach

Cancer, Problem of
Crippled Children
Children, Feeding of
Helping Your Child to be a Good Patient
Children and the Movies
Child of the Pre-School Age
Child in School
Child Welfare
Child Play and Health
Community Health
Clinics
Conquest of Children's Diseases
Costs of Medical Care
Diseases of the Chest
Diphtheria
Exercise and Health Education
Eyes of the School Child
Fair—Fat and Forty
Fat and Thin
First Aid and Home Nursing
Friction in the Family
Focal Infections
Foods
Food in Relation to Health
Glands and Personality, The Romance of
Goiter
Growing Old Gracefully
Habit Formation
Health of the Adult
Health and Beauty
Health and Charm
Health and the Depression
Health Habits
Health—High School Students
Health Talk to High School Students
Health as Related to the School
School Training in Health
Heart Disease
Heroes of Medicine
How Are You?
Infant and Maternal Mortality
Infantile Paralysis
Immunization
Making the most of Vacations
Malaria
Malnutrition
Medical Economics
Medical Education
Medical Ethics and How to Choose a Doctor
Medical Fees
Medical Organization
Medical Legislation
Medical Problems
Medicine and Religion
Men and Microbes
Mental Hygiene
Mental Hygiene—Adults
Middle Age
Outwitting Middle Age
Milk-born Diseases
Nursery Schools
Nursing
Obedience and Character
Parent and Child Relationship
Parents and Children
Parents, Teachers and the School Child
Pasteur
Periodic Health Examination
Physical Defects
Physicians in Fields other than the Practice of Medicine
Physicians, Income of
The Physician and Public Health
Pneumonia
Postponing Old Age
Posture
Pre-Natal Care
Preventive Medicine
Public Health
Public Health Outline for High School Students
Punishment
Quackery
Radio
Recreation and Health
Rosenwald Foundation
Rocky Mountain Spotted Fever
Rickets
Rural Health Problems
Safeguarding our Children
Safety First
Sanitation
Scarlet Fever
Sex Education—Boys
Sex Education—Girls
Sight Saving
Serums, Vaccines and Antitoxins
State Medicine
State Medicine and Sheppard-Towner
Summer Camps
Sunlight—Ultraviolet Light
Surgery
Teachers' Institutes
The Teacher and the Mental Health of the Child
Teeth
Tonsils and Adenoids
Tuberculosis
Value of Health
Venereal Disease
Ventilation—Air—Water
Vital Statistics
Winter Diseases
X-Ray, The

Keeper: "You think you're sane, eh? Well, if we give you your liberty will you keep away from liquor and women?"

Asylum Inmate: "I certainly will!"

Keeper: "Then you stay in; you're still crazy!" —Film Fun.

The only animal that has its full strength when one day old is white mule.

REPORT OF RETIRING PRESIDENT OF WOMAN'S AUXILIARY TO THE ILLINOIS STATE MEDICAL SOCIETY

Milwaukee, Wisconsin, June 14, 1933.

As retiring President of the Woman's Auxiliary to the Illinois State Medical Society, I wish to pay tribute to our late National President, Mrs. Walter Jackson Freeman, whose inspiration, counsel and guidance made it possible for me to outline my year s work with confidence in its consummation. May I also express my admiration for her successor, Mrs. James F. Percy, who courageously accepted the tremendous responsibility of National Auxiliary President, when the year was far advanced, without an opportunity for preparation. We feel that she has succeeded admirably in fostering established plans, and instituting valuable additional plans.

Illinois State work is primarily educational, legislative, and social although in a few outlying districts some philanthropic work is done. Many instances have been reported where individual members and County Societies have responded to the request from lay organizations to furnish speakers for health educational programs and for those pertaining to allied medical subjects. Under the direction of our Medical Society our members aided in the passage of a bill by the State Legislature regarding the compulsory use of silver nitrate or its equivalent to prevent blindness in new born infants.

This year Illinois Auxiliary has attempted to perfect the mechanics of its organization—all policies and problems have been referred to our Advisory Committee appointed by the President of the State Medical Society.

Our standing committees correspond with those of the National Auxiliary and we strive as nearly as possible to follow suggestions of the latter body.

State work has been carried on by an excellent Board of 29 women, which includes chairmen of Standing Committees. At the first mid-year Board meeting held in Chicago on November 18, 1932, 21 members answered roll call while 22 reported present at the following one held March 18, 1933. With such enthusiasm and cooperation, plus the support of individual members throughout the state, I am happy to report briefly as follows:

1. That all County Auxiliaries have Advisory Committees appointed by the respective County Medical Societies, and that Counties have conformed where practicable in forming Standing Committees to correspond with those of the state.

2. A paid membership May 15, 1933, of 500 members, an indicated loss of 59 members as reported May 16, 1932, but we estimate that 70 or more members will pay delinquent dues as soon as all banks open. This comprises 13 County Auxiliaries which leaves 79 County Medical Societies without Auxiliaries.

3. The establishment of a uniform County fiscal year, which is March 1, while that of our state is March 15, and the National is, of course, March 31.

4. The adjustment of County dues so that in the future all County Auxiliaries will follow instructions of the National Society to pay dues at the end of the County Fiscal year. In order to accomplish this, three Counties paid no dues this year because they have been paying in advance, which arrangement, of course, curtailed the income of our State and National Auxiliaries.

5. The passing of a by-law at our Annual Session this spring, which provides that a new County Auxiliary shall pay a fee of $1.00 to State Treasurer to receive representation through one Delegate at the first Annual Session following its organization, after which time it shall pay full per capita dues.

6. The formation of two new County Auxiliaries, Marion and Livingston, with memberships of 15 and 19 respectively.

7. The preparation of four programs and their distribution to County Auxiliaries. We do not use the National Study envelopes because so much material is available from the Educational Committee of our State Medical Society. This Committee is a highly organized department with a Chicago office where its Executive Secretary, Miss Jean McArthur, contributes generously of her time and ability in assisting us. Without remuneration our Auxiliaries may secure speakers from this Committee on a wide range of subjects for our own meetings or for those of lay organizations.

8. That we have secured our quota of Hygeia subscriptions, most of which have been given to public schools and libraries. Much interest in this project is manifested in many communities so this department indicates steady growth. Some of our Auxiliaries regularly collect members' copies of Hygeia and place them in public reading rooms.

9. The purchase of 2000 membership record cards from the National Auxiliary which were mailed to County Auxiliaries and are gradually being filled and returned to our Corresponding Secretary. These cards will be placed in a steel filing cabinet bought this year by the State Auxiliary, which, by courtesy of the Educational Committee of the State Medical Society is placed in its Chicago office. Here also are filed our Archives material.

10. That 42 Handbooks were bought and mailed to members of State Board and to all County Presidents with the request that they be passed along to their successors. These handbooks were enthusiastically received and I recommended that each Auxiliary worker in County or State capacity secure one and study it.

11. The adoption of a suggested set of By-laws for new County Auxiliaries and for preliminary organization work, a copy of which is attached hereto.

Also the publication of State By-laws in pamphlet form and the distribution of copies to each member in the state.

12. The purchase of a die for a State President's pin and the presentation of pins to all four past Presidents as well as to the retiring President.

13. That for the first time our Publicity Chairman received a letter from the Editor of our State Medical Journal in which he stated that the Auxiliary pages had become a feature of the publication. Unlimited space is allotted us gratis. Articles appeared in each issue this year and press notices have been sent regularly to the National Chairman. Also a comprehensive

scrapbook prepared by our efficient Publicity Chairman is on exhibition at this Convention.

Our Medical Society cooperates fully in all Auxiliary enterprises. My year ended May 17, 1933 and my duties are now invested in the proficient hands of our new President, Mrs. Solomon Jones, who will terminate a highly successful administration in May, 1934, if she receives from her President Elect, Mrs. Lucious Cole, and her Board, the loyal support so cheerfully given me.

Respectfully submitted,
GRACE R. MUELLER (Mrs. E. W.)
1420 Elmdale Avenue,
Chicago, Ill.

AUXILIARY NOTES

The sixth annual session of the Woman's Auxiliary to the Illinois State Medical Society was officially opened Tuesday morning, May 16, 1933, at the Jefferson Hotel, Peoria, Illinois, by Mrs. Hugh E. Cooper of Peoria, who extended a cordial welcome to all visiting women. In behalf of the Entertainment Committee she requested everyone to attend the various social functions listed on the program.

Mrs. John R. Neal, Past President of the State Auxiliary, responded in her usual gracious manner with a few pertinent remarks stating that memories of the successful 1930 Peoria Convention made us happy once again to be the guests of the Peoria Medical Society.

The Convention Committee and the Board of Directors decided this year to experiment with the plan of holding two open Auxiliary meetings in order to allot sufficient time to various reports. Whether or not this plan proved satisfactory seems still to be a debatable question primarily because many members did not arrive early enough to attend the first meeting on Tuesday.

Officers, Councilors, and County Presidents reported on Tuesday. The reports of Standing and Special Committees were given on Wednesday. A steady, wholesome growth was indicated by these excellent reports which will be published in this Journal in succeeding issues. Unfortunately all Board Members did not register until late Wednesday but that morning before the election Mrs. Cole, the Credentials and Registration Chairman, reported as follows:

Voting members registered and having received badges:

Officers	5
Councilors	4
Chairmen of Standing Committees	5
Delegates	20
Alternate Delegates	4
	38

The results of the annual election were published in the July Journal. Following the induction into office of the new Officers and Councilors, the President, Mrs. E. W. Mueller, of Chicago, presented the gavel to her successor, Mrs. Solomon Jones, of Danville, with sincere wishes for a happy administration. Mrs. Jones then took the chair. With a few well chosen remarks Mrs. H. B. Henkel then presented a pin to each past President, all of whom were present except Mrs. T. O. Freeman.

At the request of the Peoria Entertainment Committee no Auxiliary program was arranged for the Wednesday luncheon. On that occasion, however, the Convention Chairman, Mrs. Henkel, introduced the retiring President, Mrs. Mueller, and the new President, Mrs. Jones. Mrs. Mueller took advantage of this opportunity to thank the several hostesses for their hospitality and expressed appreciation, in the name of the Auxiliary, for the delightful social functions which the Peoria Committees had planned. As a token of appreciation of her work, the Auxiliary presented Mrs. Mueller with a beautiful electric clock.

Next year the Auxiliary will meet again in Springfield to renew acquaintances and make new ones.

Mrs. Jones presided at the post Convention Board Meeting Thursday morning when Chairmen of Standing Committees were elected, and plans for the coming year were discussed.

AMERICAN CONGRESS OF PHYSICAL THERAPY

The twelfth annual session of the American Congress of Physical Therapy will convene at the Palmer House, Chicago, September 11, 12, 13, 14 and 15, 1933. September 16 will be devoted to hospital clinics, detailed announcements of which will be made by printed bulletin not later than September 15.

DO YOU BELONG TO THE "CLIQUE".

What is the Clique? 'Tis a body of men
Who attend every meeting, not just now and then,
Who don't miss a meeting unless they are sick—
These are the men that the grouch calls "The Clique."

Who don't make a farce of that magic word "work,"
Who believe in the motto—"Not a job will I shirk";
Who never resorted to an underhand trick,
These are the men that some call "The Clique."

The men who are seldom behind in their dues,
And who from the meeting do not carry news;
Who attend to their duties and don't seek a kick;
These are the men that the crank calls "The Clique."

We should be proud of members like these—
They call them "The Clique," or whatever they please,
But there are some people who always find fault,
And most of this kind are not worth their salt;

They like to start trouble but seldom will stick—
And leave all the work to be done by "The Clique."

—Reprinted from Radiology.

Farmer's Wife (to druggist)—"Now, be sure and write plain on them bottles which is for the horse and which is for my husband. I don't want nothin' to happen to that horse before the spring plowin'."

Original Articles

THE SURGEON'S DUTY IN CANCER OF THE CERVIX UTERI*

H. S. CROSSEN, M.D.
ST. LOUIS, MISSOURI

The treatment given patients with cancer of the uterus in any community is decided largely by the surgeons of that community. As it is common knowledge that this disease requires radical measures the patient is naturally taken at once to the surgeon. In the larger cities the patient may come under the care of some one making special study of pelvic surgery. In other places the full responsibility falls on those doing general surgery.

In every case the decision as to the type of treatment is a serious matter, for it may mean the difference between life and death for that patient. As surgeons we have a heavy responsibility to these patients, and this discussion is for the purpose of giving what aid I can to the effective meeting of that responsibility.

Cancer of the uterus has occupied a very large place in surgery, particularly that form of cancer occurring in the cervix. For a long period the knife was our only resource. And surgery scored one of its most brilliant triumphs in the successful radical operation for this otherwise fatal disease.

The technical difficulties due to the deep location of the growth and the extensive dissection necessitated by the cancer prolongations out into the parametrium and to the pelvic wall, combined to make the bona fide radical operation for cancer of the cervix stand out as one of the few most difficult and exhausting operations in the whole realm of surgery. But the result was worth all that it cost in the labors of anatomists and pathologists and surgeons, and in the exhaustion and danger to the patient, for it gave a chance for life to many persons who otherwise had no chance and no hope whatever.

My personal experience with this operation extends over a long period. In fact, I have credit for the first completed Wertheim operation in the St. Louis territory. And that patient, by the way, was cured, and is still living after an interval of thirty years. Since that time I have studied and worked continuously to perfect myself in the technique of the radical abdominal operation and the radical vaginal operation for cancer of the cervix, and the lessons learned in practice I endeavored to preserve and transmit through text and illustration. Consequently, I approach the subject from the standpoint and with the viewpoint of the practicing surgeon.

It has been my labor and my delight to eradicate this disease with the knife, as far as such eradications could be accomplished. Hence I speak as a surgeon to surgeons. We are all confronted with the same serious problems in the handling of these patients. If I have had the privilege of concentrated study and experience in this particular division of surgery, it is incumbent that I pass on the lessons and conclusions from my experience.

STAGES IN TREATMENT

It is interesting and instructive to glance back over the stages by which the treatment of this disease advanced from absolute failure to the definite success and the increasingly hopeful outlook of the present day. I quote from a recent article.[1]

"Some forty years ago the treatment of cancer of the cervix was just emerging from the stage of mistaken hope in the effectiveness of ordinary hysterectomy. A few years previously the brilliant success of surgery in other gynecological conditions had raised high hopes for the cure of this dread disease by the removal of the affected organ. Vaginal or abdominal hysterectomy was the accepted treatment. Large series of patients had been subjected to this supposed radical operation with excellent immediate results. But the lapse of time had brought revelations that were disconcerting. The large number of hysterectomized patients who had done so well at first, gradually disappeared by death from recurrence of the cancer. Year by year the mounting number of deaths in the early series raised ominous forebodings. Slowly but surely, in spite of reluctance to accept it and stubborn fighting against it, there came finally the realization that hysterectomy as then carried out was not a cure for cancer of the cervix. In one large series of operations not a single patient survived five years. In other series there was only an occasional survival. The high hopes built on early results had been completely overthrown, and the profession was back where it started with no cure for this disease.

"However, this harrowing experience was not without some beneficial results. It had demonstrated definitely that there was some unknown factor in the situa-

*Oration in Surgery read before the Illinois State Medical Society at Peoria, May 17, 1933.

1. Cancer of the Cervix Uteri: Some Pertinent Facts Concerning the Treatment. Jour. A. M. A. Vol. 99, p. 2149.

tion or some known factor that required much more serious study. In the attempts to determine the causes of failure of ordinary hysterectomy as a cure for cancer of the cervix, there developed one of the most brilliant and useful pieces of pathological work in the history of Medicine.

"The clear demonstration of minute non-palpable cancer-prolongations beyond the palpable involvement of the cervix and parametrium, showed why ordinary hysterectomy did not cure the cancer. Whether the prolongations were by continuity of cell-growth or by metastatic transportation of cancer cells to outlying glands, the result was the same, namely, recurrence. The problem then became clear. Some means must be found to destroy these outlying cancer cells, which were evidently present in practically every case when the patient came under observation.

"The main steps by which treatment of cancer of the cervix advanced from practical failure to the saving of about one-fifth of the patients treated, may be briefly stated. It was noticed that the occasional cure following the simple hysterectomy of those early days occurred most frequently when the cautery was used, especially low-heat cautery application. There was evidently something about heat that discouraged the growth of cancer cells and made cautery excision more effective than excision with the cold knife. Cautery incisions even through dense cancer would often heal superficially, the cancer cells evidently being killed more deeply than the tissue cells.

"This ray of hope was followed up, and the slow cautery excision of the cervix, with baking of the surrounding tissues, was developed. This cured a certain small percentage of early cases, which was a remarkable result considering the limited extent of the excision. However, the baking process was soon overshadowed by the developing radical dissection-operation."

The radical dissection-operation for cancer of the cervix was analogous to the radical operation for cancer of the breast, in which the adjacent lymphatic drainage system was removed along with the primary growth. Through this splendid radical operation for cancer of the cervix a considerable percentage of patients was saved, and this percentage increased as the operation was gradually improved.

However, notwithstanding prolonged study and the use of every improvement devised, the radical dissection-operation was handicapped by two serious drawbacks.

a. The primary mortality was very high. Removal of the parametrium containing the lymphatic drainage-area required prolonged extensive careful deep dissection, and the resulting operative and postoperative strain placed the life of each patient in marked jeopardy.

b. The field of effective operation was limited. Only in the earlier stages of the process was there reasonable hope of cure by operative removal. Very soon the cancer cells penetrated to structures along the pelvic wall that could not be removed. In spite of notable efforts to extend the scope of operation and the splendid campaign for early diagnosis, there remained a large proportion of patients beyond the pale of operative relief.

These two serious defects in the program of cure by radical operation were recognized and appreciated by no one more than by the surgeons who were doing this work. While striving vigorously and conscientiously to give these patients every possible relief with the knife, they hoped and worked for something still better.

Along with the constant efforts to improve the technique and results of radical removal of the cancer with the knife, much study was given to another method of treatment, namely, devitalization of the cancer cells in situ. This world-wide search for a less dangerous and more widely applicable remedy brought out many so-called "cures." Time and time again the profession was carried to the pinnacle of hope, only to be dropped to bitter disappointment. The repetitions of this process naturally made surgeons very critical of new remedies for cancer. Radiation, like other proposed remedies, had to meet this healthy spirit of skepticism and analysis, which constitutes the cancer patient's only protection against fake "cures" and mistaken "cures." In the beginning of radium work and x-ray work, the results justified continued skepticism. However, improvements in materials and technique and increasing experience in the use of these powerful remedies, finally produced results that stood up under the most rigid analysis, and that placed irradiation alongside the knife as an effective remedy for cancer of the cervix.

SPECIAL EFFECTS OF IRRADIATION

When radium is applied within a cancerous mass, for example, in the center of a carcinoma of the cervix and left there for a considerable time, there are two zones of effect, as follows:

Zone of Complete Destruction of All Tissue. Within a certain distance of the radium, all tissue is devitalized and later comes away as a slough. The width of this zone varies with the

dose of the radium and the method of screening. As you know, radium gives off a variety of rays. Some are very destructive to the tissue close to the radium but do not penetrate far. For want of a better term these are often referred to as the burning rays or superficial destructive rays. Other rays penetrate deeply and exercise the differential effect in the outlying zone.

Zone of Differential Destruction. In this zone the cancer cells are killed but the tissue cells are not killed. It is this differential effect that carries the influence of radium beyond where we can go with the knife. It enables us to destroy cancer cells in the rectal wall, the bladder wall, the ureters and about the large vessels and nerves—that is, in tissues that could not be removed. You can see at once what a great advantage this is, for in most cases of cancer of the cervix some of these outlying irremovable tissues are already involved when the patient first comes under observation.

How is it that radium can exercise this differential effect? How do the radium rays kill cancer cells without killing the tissue cells? This important differential effect is due to the fact that new cells are more susceptible to destructive influence than old cells. This is a general law which obtains in all tissues and with practically all destructive influences: that new cells are more quickly damaged by destructive influences than old cells. The cancer cells are new and the tissue cells are old. Hence the cancer cells succumb to the radium rays while the tissue cells still retain enough vitality to survive.

This differential effect is not peculiar to radium, though radium gives it most markedly. Heat has this effect to some degree. An incision in a cancerous growth with a cautery kills cancer cells beyond the line of incision, a short distance farther than it destroys the mature tissue cells. That is the reason a cautery incision through a cancerous area is much more likely to heal than a knife incision. The surviving tissue cells in the narrow differential zone of cancer-cell destruction take on rapid growth and form healthy granulation, causing healing. This is a fact that has been long known, and it is the reason for the employment of the cautery instead of the knife in incisions through cancerous areas. However, with the cautery this zone of differential destructive effect is very narrow. It may be widened by using low heat and slowly baking the tissues, but even then the zone is very narrow. With radium, on the other hand, this zone of differential effect may be made very wide enabling us to accomplish much more than can be accomplished with the knife or with the cautery.

Increasing the Zone of Differential Effect. How may this zone of differential effect be influenced, and especially how may it be widened sufficiently to become a factor in the treatment of carcinoma extending throughout the pelvis? Radium in its slow decomposition gives off a complicated variety of rays. For the purpose now under consideration it will suffice to refer to the three principal kinds: The alpha rays, the beta rays and the gamma rays. The alpha rays have hardly any penetrating power, hence are referred to as soft rays. They are usually all stopped by the glass of the small glass capsule in which the radium salt is sealed, so they are of little practical importance. The beta rays are somewhat more penetrating and must be reckoned with in their effect on tissues adjacent to the radium. Their power of penetrating, however is so poor that they are largely concentrated and expended in the tissues within a short distance of the radium. That is, they also are soft rays that because of lack of penetration cannot be used to destroy cancer cells over a large area. Their effect is to cause sloughing for some distance about the radium. If a large dose of radium is used this sloughing may be extended into the adjacent rectum or bladder or ureters. The third variety of rays, the gamma rays, are the hard or deeply penetrating rays. It is upon the penetrating gamma rays that we depend for the destruction of cancer cells deep in the tissues.

Now the problem in the radium treatment of an extensive carcinoma of the cervix is to give a sufficient dose of the penetrating gamma rays to destroy the distant cancer cells throughout the pelvis, without causing beta-ray sloughing into the rectum or bladder or ureters.

In endeavoring to secure this effect, four things must be carefully considered—the metal screening of the radium, the situation in which the radium is to be placed, the packing away of adjacent organs, and the size of the radium dose advisable in that case. The metal and

rubber screening materials used immediately about the radium are usually much the same in each case. It is advisable to work with fairly uniform screening so as to reduce the number of variable factors in each case-problem. The other three factors vary greatly in different cases, and each case must be studied individually and the means carefully adapted to the conditions present in that case if the patient is to be given the best chance for the preservation of life.

Metal and Rubber Screening. The sloughing rays may be diminished by materials that have very little influence on the penetrating gamma rays. Silver and brass and rubber are such substances. Ordinarily the small sealed glass capsule in which the radium salt is contained, is placed in a silver capsule, and then the silver capsule is placed in a brass capsule. This makes the usual radium tube, which at the time of use is further screened by being placed in rubber tubing.

Distance Screening. In addition to these special screening materials there are other important items in the screening process. One of these items is distance. The effect of the rays diminishes rapidly with the distance from the radium. Consequently, to prevent sloughing of the rectal and bladder walls it is important to push these structures away from the radium as far as possible. This is accomplished by gauze packing. The posterior vaginal vault and the anterior vaginal vault are distended by a firm packing, which pushes away the rectum and the bladder. This is called "distance screening" because the important screening effect is not from the gauze used but from the distance secured. Care is taken to make the packing very firm and to adjust it accurately, according to the conditions present in each case. With such a firm packing of course the patient cannot urinate, hence the introduction of a retained catheter is necessary.

Tissue Screening. Still another item in screening-out the destructive soft rays is the mass of tissue immediately about the radium. Where the radium can be placed in the center of a large mass of tissue, this assists in checking the sloughing rays. If this tissue were scooped out first and then the radium placed in the cavity, not such a large dose of radium could be safely given. In fact one of the troublesome conditions to handle is where there has been a hollowing out, by sloughing or cautery treatment or excision, causing a thin-walled cavity. Here radium must be used with great caution or a hole will be burned through the thin wall intervening between radium and the rectum or bladder.

Occasionally a portion of a mass interferes with placing the radium advantageously, in which case the interfering portion is trimmed away. However, this trimming away of tissue should be limited to what is necessary to permit the most advantageous placing of the radium.

Dose of Radium. The dose of radium that can be safely given must be determined by a careful study of the superficial and deep conditions present in each case and the adaptation of the various screening methods to those conditions.

PROGRESS IN IRRADIATION DEVITALIZATION

Effective irradiation treatment began a decade and a half ago. Much experimentation in radium and x-ray work was carried on before that, but it was about that time that irradiation reached the effectiveness that established it as a real cure for cancer of the cervix.

Radiation cured many cases that were beyond the reach of even the most radical operation. Its striking effect in such cases caused it to be used earlier and earlier in the disease, with increasingly good results, until now it has supplanted operation as the most effective treatment for this form of cancer. Long and careful study of and participation in both operative treatment and irradiation treatment have convinced me that, with the improved methods now available, intensive irradiation gives the patient decidedly the best chance of cure. There may be special conditions requiring some operation but when required such operation should supplement irradiation and not displace it.

The change in treatment brought about by the work of ten short years is very striking, even startling. The physicians now coming on the stage of action can hardly appreciate the cancer treatment situation only a decade ago, and physicians who have not kept up with these revolutionary cancer developments are in no position to advise a patient with cancer of the

cervix. Even in the last two years there has been such development in the effective use of radium and x-ray irradiation for the devitalization of deep cancer cells, that the uncertainty as to the best treatment for the earliest cases has been removed, and it is now clear that they also are most safely and certainly cured by irradiation devitalization.

The treatment of cancer carries a greater responsibility than the treatment of ordinary diseases. It has been said that a considerable proportion of human ailments are self-curative if given time, but cancer does not belong to that class. In cancer of the cervix, only the judgment and skill of the surgeon stand between that patient and certain death within a very limited time. The patient's survival is determined largely by the surgeon's judgment in the choice of remedy and his thoroughness in its application. Consequently, it is with a profound sense of personal responsibility that he selects the plan of treatment and proceeds with its execution.

ITEMS IN EFFECTIVE IRRADIATION DEVITALIZATION

Irradiation devitalization for cancer of the cervix comprises radium treatment for close-up concentrated radiation from the center of the cancer field, and x-ray treatment for widespread effect in devitalization of distant cancer cells. Each of these powerful remedies requires experienced judgment and skill in its use.

There is general recognition of the highly technical character of x-ray work especially of this deep therapy with its high voltage machines and other special apparatus. But, as to radium, there is a tendency among the inexperienced to regard it lightly, and to feel that it may be used with little personal knowledge of its physical properties or of its special effects on the various structures in the particular area involved. This tendency is encouraged by some of the radium-rental instructions given, which presume to fit the recipient for the safe and effective use of this potent instrument. It would be as reasonable to suppose that instructions issued with a scalpel would fit the recipient to use it safely and effectively in the eradication of a cancer. Radium is as potent as the knife and in inexperenced hands may produce as disastrous results—either in the form of injury to adjacent organs or as failure to obtain results that might have been obtained by really effective use.

The obtaining of the curative effects of radium in cancer of the cervix depends on the careful carrying out of many details. Only by careful study and accurate execution of the various steps can the patient be given the best chance for cure. The essential details may be grouped under the following four headings.

a. Careful study of the special conditions present in each case. This is necessary in order to give the most effective radiation to the individual patient. The size of dose of deeply penetrating rays that can be given depends on a number of factors, including the location and size of the cancerous mass, the amount of involvement of each of the various organs in the immediate vicinity, the extent and direction of ulceration, and especially the fixation of the bladder and rectum in relation to the carcinomatous infiltration. The accurate determination of these conditions and the utilization of that knowledge in effective radium treatment requires a large amount of experience and skill in pelvic work. While in some situations the radiologist without special local knowledge may give effective radium treatments, in carcinoma of the cervix conditions are such that the most effective treatment can be given only by one skilled in pelvic work and with adequate radium training. His special knowledge of pelvic anatomy and pathology and his training in accurate pelvic palpation and diagnosis must all be utilized in the supreme effort to reach the marginal cancer cells with effective radiation.

The patient's chance for life lies in devitalization of the outlying cancer cells. It is in this particular that radium can go farther than the knife or the cautery, killing cancer in inaccessible situations beyond the reach of these other measures. One must not allow his attention to be diverted from this vital point by the striking effect of radium on the nearer portions of the cancer. The destruction of the large cancerous mass at the vaginal vault and the consequent healing, are only incidental to reaching cancer cells much farther out. This local destruction could be accomplished with the knife or with the cautery; there is nothing distinctive about it. The distinctive and superior effect of radium is the extension of differential killing ef-

fect to include cancer cells at the outermost margin of the growth. If we do not reach these outlying cells, our radium treatment has failed, except as a temporary palliative measure.

b. Maximum dosage. The danger of recurrence lies in the deep cancer cells. Our real problem, as just stated, is to reach and devitalize these deep-lying cells. The best chance of doing this is by giving as large a dose as practicable of the deeply penetrating rays at the beginning of treatment. This is accomplished by placing the heavily screened radium in the center of the cancerous infiltration and then packing away the rectum and bladder as far as possible, so as to allow the maximum dose. Never again will the conditions be as favorable for a devitalizating dose to the outlying cells as they are at the first application. If the opportunity is missed then, it will not return.

c. Supplementary deep x-ray therapy. An adequate dose of radium in the cancerous infiltration is the most effective form of radiation for devitalizing cancer cells within a reasonable distance. But in any case there may be scattered cancer cells beyond the reach of the radium. Deep x-ray therapy may devitalize these cells which otherwise would not be reached.

Formerly the x-ray was very uncertain in devitalizing effect on deeply placed cancer cells, but through great improvement in machines and tubes it has now become dependable for deep devitalization work. When radium was almost our sole reliance in cancer devitalization the radium treatment was given as soon as possible, and constituted the first step in the course. Since x-ray has now become dependable, it is advisable in most cases to give one series of that at the beginning, in order to secure some devitalization effect on the spreading margin of the growth before the disturbing local manipulation of radium implantation in the center. So our course starts with a deep roentgenization, to be followed at a selected time by the radium treatment. In the meantime douches and other local treatments are employed to diminish bacterial activity in the cancerous mass and put it in better condition for the operative manipulations of the radium implantation. By this plan the improvement secured in the condition of the operative field has been very marked, especially in the papillomatous and infected cases.

d. Careful follow-up of cases and treatment of any spots of recurrence. The importance of this and the good results often attained have been emphasized by a number of writers. The recurrences that are likely to yield to small radium applications are those in the vaginal wall, due to cancer cells that have wandered down beyond the reach of the radium applied in the cervix. If such a spot is recognized early, before any deep penetration, it may be cured by the dose of radium permissible in these conditions, especially by the employment of emanation in the form of gold or platinum "seeds." Of course, a large dose of radium, such as given at first, is not permissible after the bladder and rectum have been drawn in and fixed by the postradium sloughing and scar formation, for it would quickly penetrate into one or both of these organs.

Where there is deep recurrence, x-ray therapy is the main reliance in checking it. Various efforts have been made to reach these deep recurrences with an effective dose of radium, principally through an abdominal incision. Some good results have been reported, but, on the whole the outlook in this direction is not encouraging. The difficulty is that a deep recurrence that can be recognized is usually a widespread recurrence, requiring such a large dose of radium that it can hardly be safely applied in the midst of large blood vessels and hollow organs. The best hope for these cases probably lies in the super x-ray, running up to 600,000 volts, which is now being developed.

REQUIREMENTS FOR RADIUM WORK

There should be no antagonism of the surgeon to radium. It is simply another helpful instrument added to his armamentarium. To be sure it is an instrument of unusual quality, in that its effects can be projected far beyond the site of its actual application. Also, it can modify function as well as structure, and hence has been aptly called the "physiological knife."

The requirements for the use of radium follow the same general principles as for the use of the knife or any other potent remedy—namely, adequate knowledge of the qualities of the remedy itself and adequate knowledge of the anatomy and physiology and pathology of the structures involved and of the effects of the remedy upon them.

There is the clear path for those who wish to use radium conscientiously and with safety and full benefit to their patients. And no one is better fitted to follow that path than the surgeon, grounded in the fundamental knowledge of the structures with which he deals and experienced in the skilfull touch and sound judgment required in serious surgical work.

However, there is no easy short-cut to real efficiency in the use of radium, any more than there is to other important features of surgical work. It means real study of radium properties and effects, both physical and biological, and their use in conjunction with the anatomy and physiology and pathology of the affected area. If you were taking up the treatment of cancer of the cervix by means of the knife, you would give it hard study and also spend much time working with those experienced in the real radical operation for this disease. Similar preliminary study and experience are necessary for the safe and efficient use of radium for the same purpose.

PREVENTION OF CANCER OF THE CERVIX

There is another item in our duty as surgeons in diminishing deaths from cancer of the cervix, namely, the prevention of such cancer. It is not necessary to explain to you that chronic irritation in the cervix favors the development of cancer and that prompt removal of such irritative lesions prevents it, for you are all aware of these facts. What I do wish to emphasize at this time is the important relation of these facts to a very real crisis in the present cancer situation.

Through the splendid work of the last few decades the treatment of cancer of the cervix has advanced from absolute failure to the saving of about one-fifth of the patients. But there the rapid progress stops. The history of operative treatment and the history of irradiation treatment present the same phenomenon, namely, a rapid increase in the percentage of cures up to a certain point, and then the average remains about stationary. This average percentage of cures is better for irradiation than for operation, but even with all the improvements of today it seems impossible to push the average beyond 25%. Yet an analysis of the cures by classes shows that in early cases the cures run to 80 and 90 per cent. and occasionally even to 100 per cent. And even in advanced cases, 20 per cent. may be saved by intensive irradiation.

Why does the average remain so low? If 95 per cent. of cases of beginning cancer can be cured and 20 per cent. of advanced cases, why does the average percentage of cures hover around 20 to 25 per cent? Why does not the percentage of cures average up to 60 and 70 per cent. as might reasonably be expected with all the strenuous efforts made to get the cases early? The reason is that very few cases of cancer of the cervix are seen in the early stage. This fact is clear from the aggregate statistics from all countries. It is strikingly illustrated in our own statistics at the Barnes Hospital of the Washington University Medical School. In the analysis of our five-year results in cancer of the cervix, from 1921 to 1926, 121 patients with this disease were treated. Of the 121 cases only 3 were in an early stage—all the others showing extensive infiltration of the parametrium, most of them out to the pelvic wall. As it happened, all three of the early cases recovered, giving 100 per cent. of cures in this class. But the great preponderance of advanced cases over early ones (118 to 3) brought the average of cures down to 22 per cent.

This means of course that practically all cases of cancer of the cervix are considerably advanced before recognition. But why is the cancer not recognized and treated early, especially after all the energy and educational efforts that have been expended in that direction for years past? The reason is that the really early stage of the disease causes no symptoms whatever.

The microscopic change that constitutes the beginning of cancer does not cause bleeding nor discharge. At first there is nothing to suggest cancer to the patient nor to the physician. By the time the so-called "early symptoms of cancer" appear, the cancer has already been present a considerable period and has developed extensive, though hidden, prolongations.

It is necessary then to attack this problem in some other way than by explaining cancer symptoms to physicians and patients. We must go back of the whole cancer picture, and remove

1. Conclusions from a Study of Five-year Cures in a Series of 121 cases of Carcinoma of the Cervix Uteri. Am. Jour. of Obst. & Gynec. Vol. 22, p. 559.

the conditions which precede the cancer and cause it.

It is well established that cancer of the cervix comes from long-continued irritation in the form of chronic cervicitis, usually accompanied with laceration, eversion, infiltration and cystic change. As I have said many times, these lesions are very obvious, and their role in cancer origin is generally known, and yet they are allowed to go on and on well into the cancer age. Great pains are taken in cases of chronic cervicitis to detect the first signs of cancer so that treatment for cancer may be promptly instituted, whereas a far safer plan is to remove the chronic cervicitis promptly before it becomes cancer.

Chronic cervicitis may be cured by simple excision of the affected area of the cervix, and thus cancer prevented. But when cancer has once begun in the irritated area, cure is uncertain even by the most radical measures.

It is clear that the removal of those chronic irritative lesions of the cervix which precede cancer is an important step in the prevention of deaths from such cancer. Not only is this an important step, but it is the only step by which to secure further marked reduction in deaths from this disease.

The detection and removal of precancerous cell-activity in the cervix is a many sided problem of great importance, and one which demands vigorous and systematized action. I took up this subject in considerable detail at the recent meeting of the American Gynecological Society and it is not necessary to review this large subject now except to emphasize that the hoped for results depend on definite action by the surgeon in three directions as follows:

a. The prompt removal of chronic irritative lesions of the cervix when encountered in practice.

b. Advice to patients as to the necessity of examination for the detection of such lesions, even when there are no disturbing local symptoms.

c. Assistance in the campaign of public instruction in cancer prevention, particularly as to the advisability of examination for the detection and removal of chronic irritation in the cervix.

Such examination is required even when there are no local symptoms, for we know that even without troublesome subjective disturbance there may be sufficient chronic irritation in the cervix to favor aberrant cell-activity resulting in cancer.

This local examination may be part of the routine general examination, which many authorities are now advising as a safety measure to determine how the various vital organs are standing the wear and tear of life's activities.

SUMMARY

In brief then, speaking as a surgeon consulted by a patient with cancer of the cervix, my duty as I see it is as follows:

1. To give that patient the benefit of intensive effective irradiation for devitalization of the cancer cells throughout the pelvis, recognizing that the cure hinges on devitalization of the outlying cancer cells along the pelvic wall.

2. To give that patient the benefit of any operative procedure that may enhance the effectiveness of the irradiation-devitalization process.

In exceptional conditions some local operation may allow better implantation of the radium. However, this use of the knife or cautery is seldom needed and should be employed only where clearly indicated for a specific purpose, otherwise it is likely to do more harm than good. When required, operation should supplement irradiation and not displace it.

3. To protect that patient from half-way measures — from so-called radical operations that never reach the outlying cancer cells, and from ineffective radium and x-ray treatments that carry no devitalization into this distant crucial zone.

4. Another important item in my duty as a surgeon in lessening deaths from cancer of the cervix, is in preventing such cancer.

There are three parts in this work of prevention; first, prompt removal of chronic irritation in the cervix when encountered in practice; second, advice to patients as to the advisability of examination for the detection of such lesions and, third, active participation in the campaign of public instruction in cancer prevention, particularly that part of it which has to do with the detection and elimination of chronic irritation in the cervix.

THE DIAGNOSTIC IMPORTANCE OF THE ROENTGENOLOGIC EXAMINATION OF GROWING BONES*

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Many systemic diseases influence normal tissue functions in a more or less profound degree. These influences may be exerted by *toxins* of exogenous or endogenous origin acting directly on the cells, by *faulty or deficient nutrition,* or by *disturbances* of *metabolism* due to many factors or combinations of factors. Rapidly growing and immature tissues are more sensitive to these disturbing influences than are the mature and less actively functioning tissues. Throughout childhood and adolescence, but especially during infancy, the period of most active growth, we should expect certain manifestations of disease which do not occur at all, or only in a modified way after growth ceases. And this is actually the case.

The bones, because of their rapid growth and the peculiarities of their cellular and intercellular structure, present a particularly favorable field for a study of the effects of disease upon tissue growth. At the junction of the epiphyseal cartilage with the metaphysis where enchondral ossification occurs, there exists under normal conditions a finely balanced relationship of the processes concerned with the production of bone. This balanced relationship may be disturbed by insults to the general health of the growing organism due to many and varied causes.

Pathologists have long been able to demonstrate that certain diseases cause specific changes in the area of enchondral ossification. Roentgenology offers a means of visualizing these changes during life and has become a valuable aid in the diagnosis of many diseases of infancy, sometimes even before clinical or laboratory evidence exists.

In congenital syphilis osteochondritis and periostitis are frequently demonstrated in the absence of clinical or serologic evidence of the disease. Dr. L. J. Halperin and I, in a clinical, serologic, and roentgenologic study of 101 newborn infants of mothers with a 4 plus Wassermann reaction at the Cook County Hospital, found that 26% had suggestive clinical symptoms, 13.7% had positive Wassermann and Kahn tests, while 54.3% had either osteochondritis and periostitis or osteochondritis alone sufficiently marked to warrant diagnosis of congenital syphilis.

For all physicians who have to do with the care of children it is important to be able to properly interpret the roentgenologic evidence of such diseases as rickets, scurvy, and congenital syphilis. It is for the purpose of showing that the rapidly growing tissues at the area of enchondral ossification in the long bones of children are often a delicate index to disease, that this subject is being presented.

Enchondral ossification is said to take place in the following manner: In that part of the epiphysis lying closest to the metaphysis the resting cartilage is stimulated into activity, the cartilage cells proliferate and arrange themselves in columns. This is known as the *zone of proliferating cartilage.* Between the cell columns there are pillars composed of a cartilage ground substance which has an affinity for calcium, and as new capillaries grow up from the bone marrow and periosteum this cartilage ground substance becomes impregnated with calcium. This is known as the *zone of provisional calcification,* and it is this calcified area that makes the shadow on the roentgen film which we call the epiphyseal line. Under normal conditions the relative depth of the zone of cartilage proliferation and of the zone of provisional calcification remains constant. The cartilage cells between these pillars of calcified cartilage disappear as the result of the activity of the capillaries growing up from the bone marrow. The pillars projecting down acquire a layer of osteoid tissue supposed to be laid down by osteoblasts which have attached themselves to these projecting spicules. This new osteoid is rapidly calcified and true bone formation occurs. This zone is called the *primary spongiosa.* From a static standpoint this primary spongiosa is not efficient, so it is transformed, supposedly by the action of osteoblasts and osteoclasts, into a new spongiosa of true lamellar bone. This is called the *secondary spongiosa.*

In rickets the abnormal conditions which prevail may be summed up as follows: 1. The zone of cartilage proliferation is greatly increased in depth. 2. The zone of provisional

*Read before Section on Radiology, Illinois State Medical Society, Peoria, May 17, 1933.

calcification is very shallow; there may only be a very little in the vicinity of the periosteum at the border. 3. In the zone of primary spongiosa the trabeculae are covered with a large amount of uncalcified osteoid. Roentgenologically the appearance is as follows: 1. Coarse reticular structure of the bone in general. 2. Irregular epiphyseal line. 3. Frayed-out or mushroomed metaphysis with cupping or concavity.

In scurvy there is retardation of the activity of the osteoblasts so that very little osteoid is formed although that which is formed is normally calcified. Bone absorption however, whether due to osteoclasts or some other agency, goes on at a normal rate. The result is a certain degree of osteoporosis. The primary spongiosa is not formed because of the inactivity of the osteoblasts, the columns of calcified cartilage get no supporting osteoid tissue, connective tissue replaces the bone marrow as a so-called scaffold marrow. In reality, a marrow callus is formed as in fractures. Strewn through this scaffold marrow are fragments of broken calcified cartilage pillars of the zone of primary spongiosa. This is known as the zone of chaos, and recently has been called the scurvy line—essentially the same changes occur in the center of ossification in the epiphysis. The roentgenologic appearance in active scurvy is: 1. Wide epiphyseal line with a finely irregular appearance. 2. An area of decreased density on the shaft immediately proximal to the epiphyseal line (the scurvy line). 3. Thin corticalis of the shaft. 4. Smooth transparent aspect of the remainder of the shaft (ground glass appearance) on account of disappearance of the trabeculations. 5. A broad finely irregular white edge on the epiphyseal centers of ossification. 6. Separation of the epiphysis in severe cases.

In congenital syphilis there is retardation of normal bone growth probably due to the action of the toxins of syphilis on the osteoblasts. The results are much the same as those produced by scurvy. While the differences may usually be readily recognized in pathologic specimens the roentgenologic appearance of the two conditions is often practically indistinguishable. There is the same widened epiphyseal line with an area of rarefaction proximal to it. When periostitis is also present the recognition is simplified. The typical uniform ground glass appearance of scurvy is not present as a rule. A knowledge of the history, the age of the child, and the clinical symptoms is frequently necessary in order to differentiate the two conditions.

When for any reason the normal growth of bone comes to a standstill, as is usually the case in severe infectious or nutritional disturbances, a peculiarly dense ground substance is laid down in the zone of provisional calcification. This is known as a "Grenzscheide." When health is restored and bone growth is resumed this heavily calcified area remains and on roentgenologic examination shows as a band on the shaft proximal to the epiphyseal line. There are apparently some children who because of some constitutional peculiarity show this reaction more profoundly than others. Their bones may show a series of wide bands on the shaft at varying distances from each other, and even on the crest of the ilium they are often plainly seen.

DISCUSSION

Dr. John R. Vonachen (Peoria): I think Dr. Parmelee is to be congratulated in having the foresight to present a paper of this type for the simple reason that for years we have been overlooking the value of x-ray in early diagnosis of such conditions as rickets, scurvy and congenital syphilis.

Just last week I had a case come into the office of so-called Parrot's pseudoparalysis or acute syphilitic osteochondritis. The infant had apparently no other clinical signs of syphilis, a well developed baby, which often goes to prove that we are deceived. If we would utilize the x-ray we would be able to make early diagnosis. In these cases of so-called acute syphilitic osteitis, the supposition is that one-eighth of the cases will show bone changes at birth. At the end of three or four months a fourth will show bone changes; I speak of all cases of congenital syphilis.

This baby was perfectly well until about three months of age when suddenly it became very restless, cried a great deal, and both the parents and the physician were unable to tell what was causing the discomfort. Finally they noticed it did not use its arms and the family doctor made a diagnosis of Erb's paralysis. By x-ray we found this acute osteitis which again goes to prove that in these cases probably some day it will be a rule to do routine Wassermanns and take routine x-ray plates on a great many of those infants, particularly that type which are not doing well.

Dr. Parmelee (closing the discussion): I have nothing else to say except that the value of x-ray diagnosis of congenital syphilis is very strikingly shown in these charts, of cases we had at the County Hospital. Of course, we know that probably from twenty to thirty

per cent. or perhaps a little more of children of mothers with four plus Wassermann will not show evidence of syphilis from any standpoint during their first year. Possibly they are not syphilitic; maybe they will show evidence of syphilis later on, but of the children who do show evidence of syphilis in the first year, ninety-five per cent. of those had bone lesions, whereas a diagnosis from the serological standpoint could only be made in a very small number, twenty some per cent.

As early as 1900, Hochsinger showed the first x-ray pictures of osteochondritis in congenital syphilis. Later he made the statement that pathologic examination of infants who had congenital syphilis showed very definite changes in the long bones and it could be demonstrated roentgenologically in practically one hundred per cent. of the cases.

RECTAL OBSTRUCTION*
(Lymphogranuloma Inguinalae)

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Generalization.—Rectal obstructions are considerably more common than one is led to believe; it is a well recognized fact that the most frequent causes for stricture are carcinoma and post-operative complications. The most frequent site is one to three and a half inches from anal opening, usually at point where the levator ani musele encircles the intestine.

In general the causations of stricture of the rectum are widely distributed in their scope, yet considerable doubt is attached as to the etiology of many of these cases. One is readily convinced of the validity of this statement as he reads individual reports of proctologists in this country and other lands on this subject. In a detailed differentiation of rectal strictures one naturally becomes interested in the unknown in the hope of finding a solution. If you see considerable rectal material and do institutional teaching you will undoubtedly arrive at a case that in the past has been classified as chronic granuloma or syphilis of the rectum. These cases in the colored patients may have a positive serology test yet do not improve on anti-luetic treatment. A white patient with the same type of stricture very often does not present a positive Wassermann and these patients do not have any luetic signs or symptoms.

Literature.—This subject has been studied early in France and other European countries. In the literature in the past two to three years the luetic basis for these strictures has been discredited and it is still being stated that the etiology of these obstructions is unknown. David and Lauer (1932) refer to a group of rectal obstructions in their report in which they express belief that the etiology of chronic granulomas or the so-called syphilitic strictures is still unknown.

Lutz (1932) is of the opinion these inflammatory strictures are caused by a late involvement of the rectum in lymphogranuloma inguinalae. This, he states, can be proved by the Frei test. Lutz further states that the fact that these strictures are usually located quite low and are most frequent in women can be explained by the anatomic structure of the lymphatic system of the genital and the anorectal region in women.

Antman and Pilot (1932) are of the opinion that lymphogranuloma inguinalae is an infectious process apparently venereal, characterized clinically by an inguinal adenitis, usually ending in suppuration.

Gregorio (1932) describes these cases to be a condition of hyperplastic infiltration of the rectum, a manifestation of subacute inguinal lymphogranulomatosis. He believes that it is difficult to deny a luetic origin because serology tests are mostly positive, yet it is difficult to determine if those with negative reactions were previously infected.

Fournier described these strictures as anorectal syphilomas, a manifestation of tertiary syphilis.

Nicholas Favre (1913) describes this disease as a tropical bubo.

Discussion.—Publications on the subject of lymphogranuloma inguinalae are becoming voluminous. In studying these cases carefully and going over the literature, it occurs to me that while many individual facts were reported peculiar to these cases no correlation was attempted on the basis of a common denominator, perhaps for a good reason. My particular interest in this matter was to correlate the rectal obstructions, so frequently present in these cases, with any constant factor that may serve as a common denominator for correlative purposes. The following are the factors known thus far:

*Read before Section on Surgery, Illinois State Medical Society, Peoria, May 16, 1933.

1. One constant factor claimed by all publications is a positive Frei test as specific for lymphogranuloma inguinalae regardless of the primary lesion.

2. Presence or absence of involvement of inguinal glands has been considered a variable factor.

3. The presence or absence of rectal obstruction and fistulae individually or in combination have not been observed in every Frei positive case.

4. Likewise, the sex, age, race and serology tests have not proved to be a constant factor.

5. Elephentiasis was not present commonly.

These factors are classified in Table II.

With the exception of the Frei test in correlation with the general clinical picture of the disease there seems apparently no standard measure for comparison and inasmuch as the majority of these cases demonstrate discharge of pus in the initial stage or the late stage, it seems logical to name this an infectious process. A few authors reported staphylococci present in the pus from the affected glands. This, I have also observed in the pus from the rectal fistulae, therefore in the classification as to etiology (Table I) I am including this disease as a bacterial non-specific (mixed) infection. The presence of staphylococci may be assumed to be a secondary infection when obtained from a gland or fistulae that have become broken down—but not when a suppurating gland has been aspirated. Another standard of measure of comparison to my way of thinking should be a careful description of the type of stricture found in these cases, as in Chart I.

TABLE 1—RECTAL OBSTRUCTION
CLASSIFICATION AS TO ETIOLOGY

A. Congenital
B. Acquired

1. *Organic*	Carcinoma, Polypi, Papilloma, Sarcoma, Epethilioma, Linitis plastica
2. *Bacterial* a. *Specific*	Tuberculosis of rectum, Syphilis of rectum, Gonorrhea, Amebic dysentery
b. *Non-Specific (mixed)*	Ulcerative colitis, Pelvic infections, Prostatic infections, Hodgkins, Lymphogranuloma inguinalae
3. *Traumatic*	Post-operative scars, fistula, etc., Leukoplakia, Tumors outside of rectum

I classify these strictures as annular-tubular with apex of the stricture at about three to four cm. from the anal orifice, with the tubular formation of the stricture being distal to the annular constriction, and the apparently normal recto-pelvic colon proximal to the stricture. The finger meets with immediate obstruction

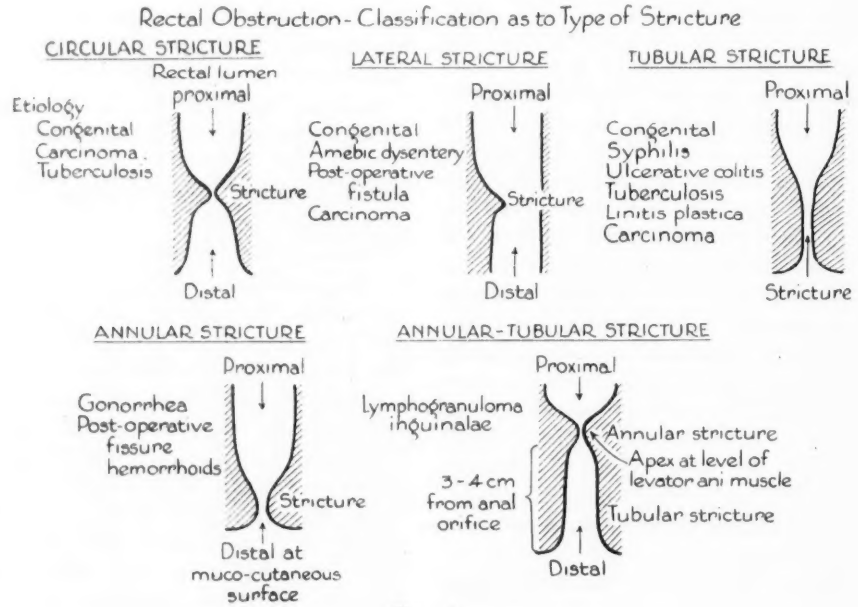

Chart 1.

on rectal examination and is of a leather-like consistency, almost stony hard to the feel and simulates syphilis of the rectum with the exception of rectal fistulae that are usually absent in syphilis of the rectum; it resembles tuberculosis of the rectum in many phases.

In the cases observed we cannot draw any correlative conclusions as to whether or not any relation exists between the presence or absence of rectal fistulae and the existent or discharging inguinal glands—in other words rectal fistulae may be present with rectal obstruction and not have any inguinal gland involvement; the reverse is also true. I have also observed the presence of inguinal adenopathy with rectal obstruction without presence of fistulae.

Frei test (1925) is usually significant, positive or negative, after the clinical course of the disease has disappeared. I believe that the reason why so few cures in these cases have been noted or why so few will be noted is because the diagnostic test (Frei test) gives positive reaction after the disappearance of clinical manifestations; at a time when it is almost too late to obtain a cure, it is, therefore, that *I suggest very strongly* that as soon as pus is suspected in a resolving soft gland a Frei antigen should be prepared and injected subcutaneously.

It is my sincere belief that at the present time inasmuch as so little is known of the etiology and treatment of this disease, it is perhaps best to apply hot applications to the enlarged glands in the acute state (initial stage) and in this way produce a premature resolution of the gland and aspirate before the gland breaks down and persists discharging (for Frei antigen) in anticipation of the abortive stage of the terminal stage of scar formation. At the present status it is wrong to claim specificity in treatment of these patients (with Frei anti-

TABLE 2—RECTAL OBSTRUCTION
CLINICAL CORRELATION OF CASES OF LYMPHOGRANULOMA INGUINALAE

Sex	Race		G. C.	Wass.	Rectal Surg.	Proct. Diag.	Fistulae	Frei Test	Ing. Glands		
	C	W							Oper.	Disch.	Present
Male	*1		1		1	1	1	1			1
		*1	1					1			1
	1		1	1				1	1		
	1		1					1	1	1	
	*1						1	1			1
	1		1					1		1	
		*1	1		1	1	1	1			
	1				1	1		1			
		*1	1					1		1	
		1						1	1		
	1		1					1			
	1					1		1	1		
Female	1				1	1	1	1			
	1		1			1		1			1
	1			1	1	1	1	1			
	1					1	1	1			
	1					1		1	1		
	1					1	1	1			
	1			1		1	1	1			

gen) when fibrosis has already occurred in the rectum—it is similar to "locking the barn after the horse has been stolen." The patients do improve in general following Frei antigen much like any infectious process may improve under non-specific protein therapy injections and the discharge of pus either from the inguinal glands or the rectal fistulae may subside partially or entirely, but the premonitory infiltrations and fibrosis in the rectal structure has been permanently formed and at present no evidence is available to show the rationale of antigen injections at the terminal stage; the infiltration and the fibrosis in the rectum remains as though no therapy had been administrated.

I have had the opportunity through the courtesy of the Dermatology Department of the University of Illinois in cooperation with Dr. Senear, Dr. Wien and Dr. Perlstein, of that Department, to study a comparatively large group of these cases, who are still under careful observation, and I hope in some future date to be in position to report our findings of the correlated rectal pathology following antigen therapy over a longer period. I have attempted in two cases the use of tuberculin hypodermically. On two occasions a very marked reaction has been noted; in one patient a temperature rose to 101.8 to 103 degrees, a chill and a pain in the inguinal region. In this patient rectal fistulae and rectal obstruction were present, with no inguinal adenopathy. The second patient did not react.

In Table II I attempted to classify clinically all cases observed with a view of correlating if possible the presence or absence of any of the outstanding findings individually or in combination. I was particularly cautious in obtaining this information, but could not definitely clarify this situation on the basis of any conclusive findings. I am, therefore content for the present at least, to assume a conservative attitude and to adhere to facts as they arise in future studies of these interesting rectal obstructions.

CONCLUSION

1. I believe lymphogranuloma inguinalae to be an infectious process.

2. Rectal obstruction is a frequent finding in the terminal stage of this disease.

3. The obstruction is annular-tubular in form.

4. The fistulae when present are usually multiple.

5. I suggest early resolution and aspiration of any evident primary or initial lymph adenitis.

6. Frei test has been positive in cases in which no rectal obstruction was present of any type.

7. Frei test has been positive in cases in which rectal obstruction of the annular-tubular type was present.

8. Frei test has been positive in cases in which rectal obstructions were present but not of the annular-tubular type.

9. More careful study is essential covering a larger group of cases to be of correlative value.

307 No. Michigan Blvd.

DISCUSSION

W. A. Hinckle (Peoria): Someone has said, "Blessed is that person, who, having nothing to say, refrains from giving wordy evidence of the fact." I am not going to demonstrate my lack of knowledge about this subject by trying to talk on it. When I was requested to discuss Dr. Streicher's paper, I thought I was to discuss rectal stricture in general, not the one particular kind about which I know the least.

In my observation covering several thousands of cases, I have found about 1 per cent of stricture. This is about half what is claimed by some proctologists. In my experience, the majority of rectal strictures are due to malignancies. Next to malignancies, the most common rectal stricture is the postoperative. Strictures due to inflammatory proctitis of various kinds, tuberculosis, ulcerative, amebic, etc., are next in frequency.

There is one type of rectal obstruction that does not seem to be very well known or understood. Miles, Gabriel and other English proctologists have called attention to an anal constriction, not a complete obstruction, that is quite common. This constriction is due to a fibrosis of the pecten, doubtless caused by infection of the crypts in this area. Most of these cases will admit the finger, though possibly with some discomfort. A more careful examination of the anal canal will show a constriction, not of the whole anal lining, but of only a very narrow band near its center. It feels much like a string tied around the anal canal. This is what Miles and others call fibrosis of the pecten, or pectenosis. This condition is probably one of the chief causes of fissure. The area, having lost its elasticity, tends to tear instead of stretch. It is also the probable cause of more reflex disurbances than any other one rectal condition with which I am ac-

quainted. It is, seemingly, a minor affair, hence is often overlooked.

While lymphogranuloma inguinalae is interesting, important and rare, pectenosis is interesting, important and very common.

Minnie Perlstein (Chicago): From January, 1932, until May, 1933, we have seen thirty-five patients with lymphogranuloma inguinalae. These patients have been seen at the Cook County Hospital and the University of Illinois. Of those, about twenty are women and fifteen are men. Of the twenty women, three are white and the rest are colored. Of the men, it is about 50-50, half white and half colored. The cases have all been Frei positive and in three instances we have had postmortem examinations to substantiate the diagnosis of lymphogranuloma inguinalae. I shall try to limit this discussion to those cases which I think are of interest to you gentlemen as surgeons.

In men the primary lesion on the penis is usually of very short duration and is usually not noticed by the patient. We have had two cases of inguinal adenitis where the primary lesion was still present. The superficial lymphatics draining the external genitalia are involved about three weeks later and a subacute suppurative adenitis results. This is usually unilateral but may be bilateral. The affected glands may involute spontaneously, but as a rule they suppurate and drain. The process of suppuration and healing goes on simultaneously and the typical picture of parallel fibrous bands with sinuses in the intervening sulci results.

In women the clinical picture is different. If the primary lesion is in the vulva, the drainage to the inguinal lymphatic glands and a marked elephantiasis of the vulva results, called "Esthiomene or Ulcus Vulvae Chronicum Elephantiasticum." The inguinal glands may or may not ulcerate. However, in women the primary lesion is usually intravaginal. The lymphatic drainage is therefore to the deep lymphatic glands, the perirectal and perianal lymph glands. These glands suppurate and by compression cause a rectal stenosis and pelvimetritis. As the process of fibrosis goes on, a rectal stricture develops due to the external compression of the rectum and the direct involvement of the rectal lymphatics. This rectal stricture is usually found about 3 cm. from the anal orifice. The rectal mucosa from the site of stricture to the anal orifice is granular due to the involvement of the submucous rectal lymphatics. This sequence has been described by Jerslid as the genitorectal syndrome of lymphogranuloma inguinalae. Clinically the patient presents all the signs of rectal stricture. There may be a secondary involvement of the perianal lymphatics and the lymphatics of the skin of the surrounding area with the formation of draining sinuses of the buttocks, fistulo in ano, and rectovaginal fistulae. If the process of ulceration is extensive, an ulcerative colitis develops with all the concomitant symptoms. We have had one woman with just this picture come to autopsy. Only last week a patient with a rectal stricture was operated on at the County Hospital after a diagnosis of lymphogranuloma inguinalae was made. The patient came in complaining of pain in the abdomen and diagnosis was made of pelvic abscess. The surgeon discounted lymphogranuloma inguinalae as the etiologic factor and on operation found multiple abscess in the lower abdominal cavity connecting with the perirectal glands. The diagnosis of lymphogranuloma inguinalae was substantiated at autopsy twenty-four hours later.

We make a plea to the surgeon that in the presence of lymphogranuloma inguinalae he does not operate until the patient's clinical condition has improved, otherwise these patients will not survive surgical interference.

The Frei test is not an autogenous test. We do not use pus from the glands to inject or test the same patient. Frei material should give positive Frei tests in any patient with lymphogranuloma inguinalae.

From the standpoint of treatment, we have been doing a great deal of work with Frei antigen. This is given intradermally with excellent therapeutic results.

Dr. M. H Streicher, Chicago (closing): In answering Dr. Hinckle I wish to say that I do not have any colored patients in my private practice. I do not, however, resent having them. If one does institutional teaching as we do at the University of Illinois it is natural that we see colored patients at the clinic. Dr. Hinckle is apparently not acquainted with the fact that lymphogranuloma inguinalae occurs in the white also. If you have seen rectal work, you have seen a case with multiple fistulae that do not heal; these cases very often have a positive Frei test and terminate in suppuration and subsequent rectal obstruction. About two years ago I operated on a white patient with one rectal fistula, one I thought was nonspecific in origin. I have learned differently since, for that patient now has several discharging fistulae with a rectal obstruction. At that time I did not know of the Frei test and was not fully aware of the associated rectal syndrome of lymphogranuloma inguinalae.

We have asked Dr. Ewert in Dr. Charles McKenna's department if they see these cases, inasmuch as they have seen cases of buboes; apparently the urologist does not see them. The dermatologists are well acquainted with this entity in Chicago and elsewhere as well as the proctologists.

Rastus: "Ah done hear yo' stayed in de haunted house last night. What happened?"

Sambo: "About two o'clock Ah woke up an' a ghost came frew de side wall es' if de wall wasn't dere."

Rastus: "An' what did yo' do?"

Sambo: "Boy, Ah went frew de other side wall de same way."

"Poetry should be written on one side of the paper only, shouldn't it?" asked a young versifier.

"That depends on the poetry," replied the editor, wearily. "Lots of it shouldn't be written on either side."

THE PROPER EDUCATION AND REGISTRATION OF X-RAY TECHNICIANS*

GENTZ PERRY, M.D.,
EVANSTON, ILL.

Following the discovery of the x-ray by Wm. Conrad Roentgen in November, 1895, all classes of scientific workers became interested in the study of the x-ray and many inventive minds proceeded to make practical applications of the newly discovered ray. Each worker followed his own plan of procedure because there were no individuals trained or experienced in any way in either technical or medical lines.

It was but natural that many physicians earnestly tried to use the x-ray as an aid in their professional work. The large majority of these efforts were made to use the x-ray as an aid to diagnosis. Many laymen, especially photographers and chemists, soon became quite proficient in producing x-ray negatives. These individuals became, in some cases, an aid to the physician. In other cases they became competitors of the physician.

The physician, because of his intimate knowledge of the structure and functions of the human body and of the results of the diseases and injuries to which the human body is exposed, was much more capable of using the x-ray for diagnostic work than was the layman. On the other hand, the layman could devote more time to the technical study of the x-ray apparatus and the physical and chemical problems of making x-ray negatives than could the busy physician who was engaged in the practice of medicine.

For these reasons laymen often produced better x-ray negatives than the physicians themselves could make and thus became, in a manner at least, competitors of the physicians instead of honest assistants to and helpers of the medical profession. In this manner, many of the early lay workers in the x-ray field actually tried to enter the practice of medicine by means of their technical skill in making x-ray views of different parts of the body and then trying to interpret the films as a diagnostic procedure. The layman's lack of knowledge of the structure, functions, and pathology of the human body makes his attempts to interpret x-ray films a dangerous procedure, and yet this pernicious evil is still being carried on in some places.

While we are gradually eliminating this evil, there are still a number of x-ray laboratories conducted by laymen in various parts of the country. These commercial x-ray laboratories are most numerous in the larger cities; they flourish under a variety of names and combinations, and it is with much regret that I am obliged to say, that these commercial laboratories are, in some cases, patronized by otherwise sensible and upright physicians.

The medical profession can and should eliminate the evils of commercial x-ray laboratories and of laymen practicing medicine under the guise of "X-ray Laboratories," "X-ray Specialists," etc.

It is, of course, much more easy to *suggest* the correction of existing evils than it is to *actually make* such corrections. However, when I have finished this presentation of facts, which will be placed before you in the next few minutes, I shall have placed before you a practical plan of eliminating the evils that have just been mentioned.

While this correction of these evils and their menace to the public health and welfare will require the patient and united cooperation of the medical profession as a whole, yet it will be of so much value to the medical profession directly, and of such great value to the public, that the results to be gained are not only self-evident, but of such importance as to merit the united and persistent support of the entire medical profession.

Let us recall briefly a few historical facts: 1. The old time physicians had various and sundry helpers, many of whom were ignorant, dishonest, and undesirable individuals. These conditions were so bad and so much in evidence that a person acting as a nurse in those days was looked down upon as a person to be more or less shunned by respectable society.

To Florence Nightingale, whose 113th birth anniversary we celebrated on the 12th of this present month, should be given the credit for developing the science of the training, registration and supervision of the modern nurse.

The terrible Crimean War in Europe, followed by the equally terrible Civil War in our own country, were the impelling events that led this remarkable woman to devote her life to the development of the training and organizing of the profession of nursing.

* Read before Section on Radiology, Ill. Med. State Society, Peoria, May 17, 1933.

The World War has been the big factor in starting an equally important movement to properly train, register, and supervise the very modern profession of radiography.

During the World War the U.S. Army Medical School very successfully undertook the work of training x-ray technicians. Many of us medical officers specializing in radiology in the U.S. Army, especially those of us in the heavy and severe service in the A.E.F., were so greatly and successfully aided by these trained x-ray technicians that we became convinced of the practical value of such trained assistants, especially when these assistants were also honest and loyal in the discharge of their duties, as were the ones trained in the Army Medical School.

Shortly after the World War we developed a plan for the double purpose of properly organizing and supervising these x-ray technicians, and of assisting said technicians to secure suitable employment in civil life in first-class x-ray departments, laboratories, and offices.

Under the guidance of the medical profession, "The American Registry of Radiological Technicians" was thus established.

Time will not permit me to describe in detail the historical development of this Registry Board nor the full technic of its work. It has been organized by the combined efforts of the three large National Radiological groups of physicians in this country and the Section of Radiology of the A.M.A. It is thus founded upon a strictly medical basis, and its organization and activities are of the most broad-minded and professional scope that it is possible to attain. The present personnel of The American Registry of Radiological Technicians is as follows: President of the Board, Dr. H. B. Podlasky, Milwaukee, Wis.; Vice-President of The Board, Dr. Robert Arens, Chicago; Secretary, Dr. Ernst A. Pohle, Madison, Wisconsin; Examiner, Dr. Geo. M. Landau, Chicago; Executive Secretary of The Board, J. R. Bruce, Saint Paul, Minn.

Every x-ray technician registered by this American Registry of Radiological Technicians is carefully examined, and his or her record and standing fully investigated before the Board accepts said applicant for registry. Furthermore, all such registered x-ray technicians are kept under careful supervision. They take a pledge to do no film interpretation nor to do any x-ray work of any kind except under the direction of an ethical physician in good standing.

All of these x-ray technicians, or Radiographers, are kept under constant supervision, and in case they do not live up to the standards above mentioned, their registry is cancelled.

It is thus very plainly evident that any physician employing an x-ray technician can make certain of getting a competent and reliable technician by employing one who is registered as above explained. Both male and female technicians may be thus obtained, and at no greater cost than the physician often pays for incompetent help. You can ascertain the exact present standing of any registered x-ray technician by writing to J. R. Bruce, Executive Secretary of The Board, 2642 University Avenue, Saint Paul, Minn., provided you enclose stamp for a reply.

I now come to another very important part of this discussion:—What the nursing profession owes to Florence Nightingale, the radiographers profession owes to Mrs. Emma Cutts Grierson. Born in Wisconsin where she received her elementary and college education, Emma Cutts came to Chicago and took a regular course of nurse education and training at Cook County Hospital. She then located in Saint Paul, Minn., where she worked as a professional registered nurse for many years.

After her marriage she also became interested in technical x-ray work and organized the Northwestern Society of Radiographers. She later helped to organize the American Society of Radiographers and was its President for several years. Through her efforts only the very best of the x-ray technicians were enrolled in this American Society of Radiographers, and she upheld a high standard of professional and moral ethics. She also established a very creditable scientific little Journal, called *The X-Ray Technician,* as the official journal of the Society. She was the editor of this journal at the time of her death.

As before stated, The American Society of Radiographers is composed of the older and better class of x-ray technicians of America. Its membership embraces Canada as well as Mexico and the Central American countries. This Society which now has 468 members in good standing, is very earnestly supporting

The American Registry of Radiological Technicians. That Board, in return, recognizes the value of the highly ethical organization of the American Society of Radiographers. Any properly trained and efficient x-ray technician of good moral standing, who is not connected with a commercial x-ray laboratory, or other unethical x-ray work, may become a member of The American Society of Radiographers.

At the annual meeting of that Society, held in Saint Paul, Minn., in May, 1931, The American Society of Radiographers created The Council on Education and Registration to plan a comprehensive course of study and training for the development of future x-ray technicians. In order to show you how broadminded, practical and loyal to the medical profession this Society of Technicians is, I want to inform you that they invited three Radiologists, Dr. B. C. Cushway of Chicago, Dr. Roy Kegerreis of Oak Park, Ill., and myself to become members of this Council on Education and Registration, and thus placed the matter of their future development and registration very largely in the hands of the medical profession.

We have had several official meetings of this Council on Education and Registration and have, we believe, worked out a practical course of study and training for x-ray technicians. This course of study and education was presented to The American Society of Radiographers at their seventh annual meeting held in St. Louis, Mo., in May, 1932, and was formally approved of by the Society in executive session.

The full text of this course of study and training was published in the July, 1932 number of *The X-Ray Technician*. I shall hand in the full text of this outline of study and training with this paper, but, unless so requested, I shall not take up your time to read it now.

COURSE OF STUDY AND TRAINING FOR X-RAY TECHNICIANS

QUALIFICATIONS OF APPLICANTS

A. All candidates admitted to this course must be at least twenty-one years of age and have as good health and personality as is required of candidates for admission in the first class Nurses Training Schools throughout the country.

All candidates for this course in radiography must present a written application for this course so that the application and qualifications of said candidate be made a matter of record. These applications must show that the candidate possesses a diploma of graduation from an accredited High School and that such candidate has successfully finished the subjects of physics, algebra, geometry, physiology and chemistry as they are ordinarily covered in the average High School course.

In addition to this basic requirement, said candidate must be either: (1) A graduate nurse; (2) a person who has successfully finished at least two years of the regular course of training in an accredited Nurses Training School; or (3) a person who has successfully finished the first two years of a college course in science, preference to be given to candidates for this course in radiography in the order named.

B. This course in radiography is to be given only in hospitals of at least one hundred bed capacity and maintaining an accredited Nurses Training School, or in large medical Clinics approved of by both the Council on Education and Registration and by The American Registry of Radiological Technicians.

C. The time of this course is to be one full calendar year. The work to be divided between the various subjects of training approximately as designated in the time allotment shown after each subject named in the course, it being understood that certain subjects may be studied concurrently with other activities of this course as may best fit in with the activities of the school or X-ray department where the course of instruction is being given. It is, however, distinctly understood that all students taking this course in radiography are to devote their entire time and energies to this course and are not to be expected nor permitted to do any other work during the entire year that they are taking this course.

D. The course of instruction is to cover the following subjects in approximately the order and time designated below:

CONTENT OF COURSE

Theory—3 months
Practical work—9 months

SUBJECTS TAUGHT

1. General elementary anatomy and osteology, regional and surface anatomy—12 weeks.
2. Physiology—12 weeks.
3. Nomenclature and terminology—full year.
4. Fundamentals of physics and electricity, including light and X-rays—12 weeks.
5. Roentgen apparatus and mechanics—40 weeks.
6. X-ray tubes and production of X-rays—4 weeks.
7. Dark room chemistry and technic—12 weeks.
8. Basic technic factors and development of technic for all standardized procedures in radiography, and demonstration and practice of exposure technic for various parts of the body; rapid, slow, soft tissue work, etc., including effect of the factors of technic—kilovolts, milliamperes, distance, time—40 weeks.
9. Bedside unit—construction, operation and technic—4 weeks.
10. Electrical and radiation dangers and protection; trouble shooting—40 weeks.
11. Positioning—40 weeks.
12. Filing records; record keeping, history taking typing—12 weeks.

13. Ethics; department management—12 weeks.
14. Calibration of machine—4 weeks.
15. Preparation of patient—12 weeks.
16. Technic of fluoroscopy—4 weeks.
17. Management of casts and splints—12 weeks.

GENERAL PLAN OF COURSE

I

Rotating Service with new students admitted every three months or every six months, depending upon the size of, and amount of work done by, the institution giving the course of training.

II

Dark Room—Chemistry; care of screens and films; developing.

III

Office—Filing; typing and record keeping; waiting upon attending physicians; history taking and making of appointments, etc.

IV

Junior Technician Service—Keeping linen in order and assisting in keeping X-ray equipment clean and in order; preparing opaque enemas, under the supervision of Senior Technician, and assisting with fluoroscopic examinations; doing simple radiographic work on extremities.

V

Senior Technician Service—Preparing opaque material for gastro-intestinal examination; supervising and assisting junior Technician in all of the latter's activities; taking care of all important radiographic work, such as gall-bladder and gastro-intestinal cases, chest films, head films of all kinds, all stereoscopic film work and all soft tissue and other particular technic.

VI

Therapy Service—Senior technician assisting the radiologist in therapeutic use of X-rays and radium; also taking care of dental radiography and bedside unit.

I trust that I have made it plain to all of you that if you will employ only registered x-ray technicians, or only those physicians who employ registered x-ray technicians, you can, in a very few years, eradicate the dangerous nuisance of commercial and lay x-ray laboratories.

In closing permit me to state that all members and officials of the Board of The American Registry of Radiological Technicians and also all members of The Council on Education and Registration are serving without any pay or compensation of any kind except that of a satisfied concience of having performed our duty in the service of and for humanity.

Furthermore, the above organizations function for the whole of North and Central America. We have thus far succeeded in keeping these things completely out of the hands of all local, state or national politicians. It is our earnest desire to keep these activities on a strictly professional basis, and we are definitely and positively opposed to any and every form of state licensing or other political registration of x-ray technicians.

We feel that it is not only the duty of the entire medical profession to give these matters your undivided support, but we believe that we have shown you a practical way to eliminate the Commercial X-ray Laboratories and dishonest lay x-ray technicians.

DISCUSSION

Henry Grote (Bloomington): I think there was not enough truth told in the paper, in regard to the presentation of conditions as they are. Probably the great mistake at the beginning of roentgenology was the fact that large educational institutions did not take hold of it and put at least the fundamentals of radiology in their courses. The result was that not only the man that was scientifically inclined, but also the adventuresome or the curious, then the desperate, came into the field and they played with it. The result was they simply raised a crop of dragon's teeth which has existed for quite a long period. It is only recently that we have been able to get really trained technicians.

In the medical profession we have had several different kinds of doctors, we have had the ignorant, the dishonest man, then we have the very brilliant man who is also sometimes dishonest, those men who employ any one who are "yes" people; in other words, "yes" technicians. I do not know that there is going to be a millennium reached very soon in which we are to have absolutely intelligent, honest technicians. I do not believe that will happen as long as we have the ignorant in the profession, as long as we have the brilliant, dishonest man, because he is going to develop these dragon's teeth.

Personally, I hope that this plan will work out rapidly. I think it ought to be published. It is a very meritorious effort and it has absolutely honest men back of it.

There is one other consideration. The reason that we have the commercial laboratory and the reason that we have the dishonest technicians, and by that I mean the "yes" technicians, is the fact that the hospitals are largely in control of the manufacturers. They have over-sold the country on x-ray equipment, as well as hospitals. With the control of the majority of hospitals by the manufacturers, it would be very difficult to produce an honest, smart, intelligent technician. I think that might be incorporated in the report of the Council and those who are not afraid of manufacturers will certainly not be afraid to say something along that line. Personally, I am not in very good standing with any manufacturers because I do voice these sentiments. The one sentiment they don't like is the fact that they cannot sell brains with the equipment.

B. C. Cushway (Chicago): You know this is the day of the new deal. Why not give the radiological technician and radiology a new deal? There is one thing I

think we should make up our minds to do as physicians; to try to disassociate ourselves from the lay worker and from the layman in any association in medical work. We have had expressions from those who have spoken previously about the mistakes we made early in taking lay people in and training them to be our assistants in radiological work. We now have a plan on which the Council of Education has spent a good deal of time and thought. We feel it is a good thing. We certainly wish you would cooperate in this problem.

There are two separate problems. The first is the educational equivalent of the technician or the technician to be, whom we are to take into training. We know in all lines of endeavor, industrial and commercial work, the higher standard of education is absolutely necessary and it is getting higher and higher. Certainly we who are professional men and working with scientific apparatus can do no better than to fall in line with industry.

Aside from the problem of the preliminary educational training of the potential technician is the second problem, which is the training itself. The training must be of a sufficient length of time spent in the theoretical and practical side of the work to enable the technician to have a thorough understanding of the problem.

Strange as it may seem, there are radiologists in the country who do not feel very kindly toward having technicians trained by any one other than themselves, and this seems rather a narrow-minded outlook on the subject. This same condition existed in medical training years ago. As we all know, a man who wished to engage in the practice of medicine went in as understudy with a preceptor and was trained by one man. In the early days of nursing the same condition existed. We all feel there are many advantages in the present training for the practice of medicine, also the training of nurses for the practice of nursing.

I would like to add, in conclusion, that this plan has been worked out through the wishes of the technicians themselves who are very cooperative, and have a keen sense of appreciation of what this problem means. It has also been worked out through the Council of Eduation and with the cooperation of the registry board. I hope you will give this subject favorable consideration.

Dr. Perry (closing the discussion): I think Dr. Grote's bringing out the matter of the "yes" technician is a very fine thing. You know all the hospitals, at least ninety per cent, are trying to use their x-ray departments as a source of revenue. To that end they are not only using technicians but physicians. This very pledge which the technicians take, if they register with the American Board, prevents them from being "yes" technicians. They have to function ethically whether their employes want them to or else they are dropped from the registry. I have had a number of instances of that type come up.

In regard to the technicians coming under the manufacturers, I have only told you the pleasant features of this.

I have had so many absolute quarrels, personal discussions with some of the x-ray salesmen and manufacturers that some of them won't speak to me any more.

The x-ray manufacturers are to blame for a lot of this. There is high pressure salesmanship placing x-ray equipment into the hands of everybody who will buy. Taking the office girl and training her to be a technician in a few weeks is one of the most pernicious things we have had to encounter, and, believe me, we have fought it hard. I do not wish to tell you about a lot of destructive things we have gone through, but you are absolutely right in that respect. I heartily concur with everything that has been said in these discussions.

Dr. Arens brought out the matter of the Kentucky board. These State Boards are a pernicious evil. There is an x-ray technician in Chicago who is taking in everybody he can take in, gives them four weeks of training and a very beautiful diploma, signed not only by himself but by the superintendent of the hospital where he works.

I wish to thank you for the interest you have taken in this subject.

FINDS SOAP AND WATER VALUABLE GERM KILLERS

Common ordinary soapsuds, particularly hot ones, are extremely good agents for killing germs, Dr. John E. Walker of Opelika, Alabama, has recently reported to the American Medical Association. The germs of pneumonia, meningitis, diphtheria, syphilis, gonorrhea, influenza, and the streptococcus germ were all killed in about two minutes by comparatively weak solutions of soap in cool water, Dr. Walker found from his own and other investigations.

The soapsuds compared favorably with many newly synthesized chemicals in germ-killing power. The brand of soap apparently made no difference, brown laundry soap, floating white soap, perfumed toilet soap, cocoanut oil and olive oil soaps, and soap made according to the standards of the U. S. Pharmacopeia were equally effective.

"When properly used for cleaning the hands or for washing eating utensils, soaps are undoubtedly potent factors in preventing the spread of diseases due to these organisms," Dr. Walker concluded.

However, the germ of typhoid fever and the staphylococcus organism are not destroyed by soaps, he added.—*Science Service.*

The only time a pedestrian ever has the right of way is when he is en route to the hospital in an ambulance.—*Greensboro (Ga.) Herald-Journal.*

The idea is advanced from New York that hardware dealers sell drugs in competition with drug stores that sell hardware. This might be a sort of counter irritant.—*Weston (Ore.) Leader.*

Tex Guinan's appeal to "give the little girl a hand" might have helped the dear little creature a lot had the hand landed on the right spot.—*New Orleans States.*

Scientist says that this universe is made up of protons, photons, electrons, and neutrons. He forgot to mention the morons.—*Dunbar's Weekly.*

Singing increases the blood-pressure, declares a Southern doctor, but he doesn't say whose.—*Boston Herald.*

WHAT IS BLINDNESS?

A PLEA FOR THE MORE FREQUENT USE OF SIGHT SAVING CLASSES IN THE PUBLIC SCHOOLS*

A. L. ADAMS, M.D.,

Ophthalmic Surgeon to the Illinois School for the Blind

JACKSONVILLE

When it is considered how long the standard of normal vision has been established, is it not strange that there should not be a more definite idea of what really constitutes blindness?

It has been described "As an incurable total loss of sight." The popular definition of it however is, "That condition in which the sight is so diminished that any occupation requiring the use of the eyes is impracticable."

The Workmen's Compensation Act, the various Blind Pension Acts, and the laws governing the education of the blind, call for an exact definition of blindness.

In deciding whether or not a given person is blind it is often necessary to fall back on legal interpretation, to find out the intent of the law.

Maine defines blindness as "less than 1/10 vision," 20/200 Snellen. In Missouri, blindness is defined as "Vision not greater than light perception." Nebraska defines a blind person as "One who is destitute of useful vision so as to be incapacitated for the performance of labor, rendering such person incapable of earning a support." Ohio, New Hampshire, Nevada, California and Idaho define a blind person as one who has a defect of vision incapacitating him to earn the necessities of life.

Educational blindness is present when the person cannot, because of loss of vision, receive an education in the public schools. Efforts have been made to establish a definite limit in visual efficiency. Some authorities would place this at 20/200 or 1/10 vision. Others would place it at 20/70th.

Mr. Lewis H. Carris (managing director of the National Society for Prevention of Blindness) says in one of his reports: "In general, it is considered expedient to call a person blind who has only 1/10 of visual acuity. But what about those of us who do not know what one-tenth of vision means, and how to measure sight? Then again, it is not sufficient to consider only the degree of vision; the extent of the visual field is an element of highest importance, and there are other factors to consider as well. It is necessary in censuses that each doubtful case be considered by a specialist with his complicated equipment in order to control these various standards."

Mr. Carris quotes the following definition of blindness from "Handbook on the welfare of the Blind in England and Wales": "The Ministry of Health in circulars 681 and 780 explained the principles which they adopt in deciding whether a person is too blind to perform work for which eye sight is essential. Briefly, only visual factors can be taken into account and other bodily or mental infirmities should be disregarded."

Where the acuity of vision (refractive error being corrected) is below one-twentieth of normal (3/60 Snellen), the person may be usually regarded as blind. Where the acuity is better than 6/60 (Snellen), the presumption is that the person is not blind unless there are such counterbalancing visual conditions as great contraction of the field of vision marked by nystagmus, etc. "The test to be applied is not whether a person is unable to pursue his ordinary occupation, or any particular occupation, but whether he is too blind to perform work for which eye sight is essential."

Dr. Edward Jackson, in the *American Journal of Ophthalmology*, March, 1933, says: "Total blindness, loss of all light perception is entirely different from economic blindness—inability to perform any work for which sight is essential; or from educational blindness—too blind to read the ordinary school books used by children. It has been attempted to fix the limit of blindness at a certain fraction of full visual acuity at a distance at less than 6/60 or 1/10. But to ignore the field of vision and the light sense, admits grave confusion and injustice."

In discussing the certification of blindness, N. Bishop Harman, of London *(The Medical Officer,* Dec. 24, 1932), who has done much to prevent blindness and assist the blind, mentions three cases that illustrate the practical difficulties encountered. A woman with chronic glaucoma, V=6/9; but with field limited to 5° from the fixation point, can read when she can find the place; but cannot walk without being

*Read before Section on Eye, Ear, Nose and Throat, Illinois State Medical Society, Peoria, May 17, 1933.

led and cannot shake hands with a visitor.

A country parson, with central senile choroiditis and central V=0, but a good peripheral field, has complete freedom of movement, and knows his prayer book; and so goes about and performs all his parish duties. A volunteer officer with retinitis pigmentosa, had full vision and good fields, by daylight, but had to be led when marching at night.

Organic blindness due to ocular lesions can be recognized or excluded with certainty. But psychic blindness, as illustrated by "Shell Shock" and hysteria may puzzle or defeat the most experienced diagnostician. Seeing is done, not with the eye, but with the brain. The great mass of cerebral convolution, that have developed with accurate macular vision, explains the enormous influence of vision upon all our consciousness; and suggests the possible influences of cerebral function upon vision.

Perhaps the broad practical definition for blindness is important deficiency of useful vision. In Schools for the Blind it is recognized that a large proportion of children have some sight. Harman says, "Where there is no full provision for children with defective sight, and no choice between elementary school and the Blind School, it is inevitable that border-line cases will be drafted into the Blind Schools. The certification of blindness in children can rarely be final. It should always be recognized as provisional and subject to revision. No sharp and permanent line can be drawn between blind and seeing, either by a formal definition, or a scientific test; and it is not desirable that there should be a discrimination."

The majority of those called blind can find satisfaction and usefulness in the exercise of the remnant of vision they do possess. The most that can be done for them is to help them keep and use what sight they have. When it becomes necessary to discriminate between the seeing and the blind, for purposes of education or care, each case should be carefully studied for itself by a person trained and experienced for such examination, both as to ocular conditions present, and as to other abilities and surroundings.

As examiner of the eyes of those making application for entrance to the Illinois School for the Blind, I have been deeply interested in this problem and feel that much can be accomplished by a consideration of these questions presented to you today.

The decision as to the advisability of having a child with defective vision continue with his handicap in the public schools or to send him to the School for the Blind is often not easily made. It should depend not only on the actual eye conditions present, but on the probable outcome. We know that the vision in some children will in all probability improve, while in others, even though the vision is fairly good, we know it will inevitably become worse. The field of vision and the light sense must be carefully considered.

There should always be an opportunity for a revision of opinion; should the vision improve and the eyes be in a condition of health the student should return to a sight saving class or to the public school.

As the children come from all parts of the State it is important that competent advice should be had as near their homes as possible before application is made to enter the School for the Blind. By this examination the amount of vision present, the necessity for treatment or operation would be determined.

I would recommend to the Board of Public Welfare the appointment of official examiners in all the larger cities of the State, who should be members of the Eye Section of Illinois State Medical Society who would make the preliminary examination of the eyes of those desiring to make application for admission to the School for the Blind. The final decision to be made by the Ophthalmologist in charge at the School, after sufficient time for examination and observation.

The ophthalmologist of the School for the Blind or of Sight Saving Classes should be given the findings of these examinations by the examiners of the blind before an application is made for their admission. A moderate fee should be paid to these examiners by the state, for this service.

From the larger cities most of the applicants have had competent advice from physicians and social service agencies, but often those coming from the country or small towns have the application made out by a neighbor, visiting nurse or an optometrist with the question as to the cause of blindness answered by "Fever," "Sore Eyes," "Had a Fall," or "Don't

Know" and the query as to the amount of vision is answered by "Poor," "Can See Large Print," "Can see to get about."

The physician near home has the opportunity of getting more or less history from the parent or guardian, which is of great importance in determining the cause of blindness. When we find both eyes shrunken to the size of small buttons or even enucleated, and no history attached, the "Undetermined" in the records become understandable.

The basic law providing for the Education of Blind or Deaf Children is as follows:

EDUCATION OF DEAF AND BLIND CHILDREN

An Act to make provision for the education of deaf and blind children. (Filed June 28, 1917. L. 1917, P. 734).

683. DUTY OF PARENTS OR GUARDIAN. Section 1. Be it enacted by the People of the State of Illinois, represented in the General Assembly; It shall be the duty of every parent, guardian or other person, having the control or charge of any child in this state between the ages of eight and eighteen years, who is deaf or blind, or whose hearing or vision is so defective as to make it impracticable to have such child educated in the ordinary public Schools of this state, to send such child to some school under private or public supervision, where special provision is made for the education of the deaf or blind; if there be such a school within the county where such child resides, then such child may be sent thereto, but if not, then to some other convenient school of that character, within the state or to the Illinois School for the Deaf, or to the Illinois School for the Blind, at Jacksonville. Provided, that nothing herein shall require a child not physically or mentally competent to be educated, to be so sent.

(Smith-Hurd, 1929—Chapter 122, Article 682, Section 1, Page 2727.)

The opportunity for difference of opinion in the interpretation of this law can be easily seen. Given a child with even slightly defective vision, with an active mind and full of mischief, who fails to keep pace with his fellow students, a teacher overworked with from forty to fifty pupils, a visiting nurse and the stage is set for another applicant for the School for the Blind.

On the other hand, it is not at all unusual to have the field workers find a blind child whose parents had never heard of a School for the Blind.

During the past year among 250 pupils in the School for the Blind 109 either had no vision or light perception only. Seventy-three could only count fingers. Fifty-five had vision with correcting glasses of 20/70 to 20/200. Thirteen had vision of 20/70 or better.

Of those having vision better than 20/70 three had high myopia. One had vision of 20/30, contracted fields and night blindness. One had vision of 20/45 with coloboma choroid and nystagmus. Several had congenital cataract; with correction had vision of about 20/45. One with vision of 20/60, had macular changes. Five had vision of just 20/70ths with the better eye.

While 55 of these 250 pupils have a vision between 20/70 and 20/200 and would seem to be eligible for sight saving classes, we find that a large majority of them are from small cities and country districts where no such classes are available.

The State requires these children to be sent to school between the ages of eight and eighteen and at present except in the larger cities, the School for the Blind is the only available place for them to attend school.

A method for the education of these children with partial sight was first developed in the United States by Mr. Edward E. Allen, a director of a School for the Blind in Massachusetts. This school opened in April, 1913.

The plan consists in using the vision available under the most favorable circumstances. The teacher of these sight saving classes should have special training for her work, after from two to five years experience in teaching children with normal vision. This special training is available at the summer courses at Columbia University, the Universities of Chicago and of Cincinnati and other universities. An intensive training for six weeks will enable a teacher to conduct a class.

Mr. Edward T. Myer in his survey of Sight Saving Classes in the Public Schools of the United States gives sixteen as the largest number possible to be included in a sight saving class. These classes have been maintained in cities of only 3,600 school enrollment. The per capita cost at the Illinois School for the Blind last year was $862.41. The average cost per pupil enrolled in the public schools of Illinois for 1931-32 was $95.52.

About 4.5 per cent of the pupils in sight saving classes in the United States are returned to the regular classes in the public school after from one to two years' time.

At the present time there are 44 sight saving classes in Illinois; thirty-three in Chicago, two in Joliet, two in Rockford, two in Rock Island, one in each of the following cities: Aurora, Elgin, Evanston, Springfield and Villa Park. There are usually twelve to fourteen children in each class. Villa Park, with a population of 6220, is the smallest city in Illinois in which a sight saving class is established and to it come children from all over Du Page County.

Where the vision of an applicant in the better eye is found to be 20/70 or better, and there is no active pathology endangering vision present, the applicant should always be referred to a sight saving class, providing one is in operation in the city from which he comes.

By the law passed in 1929 the State will provide $250.00 per annum toward the maintenance of one pupil in a sight saving class. It is as follows:

An Act to enable School Directors, Boards of Education and Boards of School Inspectors to establish and maintain classes and schools for children, deaf, blind, and having defective vision, and providing for the payment from the State Treasury of the excess cost of maintaining and operating such classes and schools over the cost of maintaining and operating elementary schools for normal children and to repeal a certain Act therein named.

July 1, 1929.

Be it enacted by the People of the State of Illinois, represented in the General Assembly;

Section 1. Boards of education, school directors and boards of school inspectors, whether acting under the general law or under a special charter, shall be empowered to establish and maintain classes and schools for children, deaf, blind, and having defective vision, who are residents of their respective school districts.

Section 2. Such boards of education, school directors and boards of school inspectors may acquire sites for such schools anywhere within the counties in which their respective school districts are situated in the same manner as is provided in the case of the acquirement of public school sites in said respective school districts, and authority is hereby expressly granted for this purpose.

Section 3. The boards of education, school directors and boards of school inspectors establishing and maintaining such classes, school or schools, may employ a superintendent and all other necessary officers, agents and teachers for such schools and classes, and shall prescribe the method of discipline and the course of instruction therein, and shall exercise the same powers and perform the same duties as are prescribed by law for the establishment, maintenance and management of other classes and schools, and in addition thereto, shall have all powers necessary to carry the terms and provisions of this Act into operation and effect.

Section 4. If a child resident of one school district attends in another of said school districts a class for the blind, or deaf, or for those with defective vision, or a class in which some special instruction needed by the child because of his handicap is provided, by the board of education, directors or board of school inspectors of the school district in which he resides shall pay to the school district maintaining the school or class he attends his tuition in a sum equal to the tuition in the school district in which such class is located for a child of normal instruction needs. The board of education, directors or board of school inspectors of the school district in which such child resides shall pay for his transportation to the class in other school district, unless the school officials of the school district in which the class he attends is located provide his transportation to the class.

Section 5. No person shall be employed to teach any class or classes in such school or schools who shall not have first obtained a certificate of qualification for teaching in such school or schools, as provided by law. But no person shall be authorized or employed to teach the deaf who shall not have received instruction in the method of teaching the deaf for a term of not less than one year, and no one shall be employed to teach the blind or those having defective vision, who has not had the benefit of special training approved by the Superintendent of Public Instruction.

All classes or schools maintained for children, deaf, blind, or with defective vision, shall be established for the benefit of such children who are between the ages of three and twenty-one years.

Section 6. Each board of education, school director and board of school inspectors shall keep an accurate, detailed and separate account of all moneys paid out by it for the maintenance of such classes and schools and for the instruction and care of the pupils attending them, and shall report the same to the Department of Public Welfare for the approval, on vouchers, prescribed by said Department, on or before the third Monday in August in each year, together with the excess of cost for each and every pupil for each school year, ending in June, over the last ascertained average cost thereof, for the instruction of normal children in the elementary public schools of its school district for a like period of time of attendance, as such excess shall be determined and computed by said board of education, school directors or board of school inspectors.

Section 7. The aggregate excess cost of the maintenance of such classes and schools, as determined, computed and reported by the said school officials, as provided in Section 6 of this Act, shall be, and the same is hereby, made a charge against the State of Illinois, and such excess costs shall be paid annually to such board of education, school directors or board of school inspectors, as the case may be, on the warrant of the Auditor of Public Accounts out of any money in the treasury appropriated for such purposes on presentation of proper vouchers approved by the Department of Public Welfare; Provided, however, that such excess costs for each pupil shall not exceed the following amounts: For deaf pupils, $110.00 a pupil; for blind pupils, and those having defective vision, $250.00 a

pupil. If a child is both blind or has defective vision and deaf, he shall be counted as full time pupil among those with each kind of defect, in determining the state's contribution to the classes for such children, provided the work and attention necessary for both types of children are afforded him.

Section 8. All classes and schools established according to any of the provisions of this Act shall be subject to the general supervision of the Superintendent of Public Instruction.

Section 9. The Auditor of Public Accounts is hereby authorized and directed to draw his warrants on the State Treasurer on or before the first Monday in September of each year for the respective sum of excess cost theretofore reported to him, as provided in Section 7 of this Act, upon the order of the Department of Public Welfare.

Section 10. An Act to enable school directors and boards of education to establish and maintain classes in schools for deaf and dumb and blind and providing for the payment from the State Treasury of the excess cost of maintaining and operating elementary schools for normal children, approved June 2, 1911, in force July, 1911, as amended, is hereby repealed.

The examination made by the proposed examiners of the blind should include a report on each of the following subjects:

Name.....
School.....
Address.....
Grade.....Age.....Sex.....
History of Eye Condition:
CONJUNCTIVA ....
CORNEA ....
PUPIL REACTION ....
FUNDUS EXAMINATION ....
VISION WITHOUT GLASSES..... .....
REFRACTION UNDER A MYDRIATIC ....
VISION WITH GLASSES..... .....
IS THE CONDITION STATIONARY IN YOUR OPINION? .....
WILL STUDY BE HARMFUL TO THIS CHILD?
.....
WHAT IS YOUR DIAGNOSIS OF THIS CHILD'S CONDITION? .....
WHAT IS THE PROBABLE CAUSE? .....
ARE THERE ANY RELATIVES WITH EYE DEFECTS?
.....
REMARKS:

	O. D.	O. S.
RECOMMENDATIONS:		
1. PUBLIC SCHOOL.....		
2. BLIND SCHOOL		
3. SIGHT SAVING CLASS—with or without glasses		
4. AMOUNT OF EYE WORK PERMISSIBLE		

EXAMINER .....M.D.
ADDRESS .....
DATE.....

This form is suggested by the Illinois Society for the Prevention of Blindness.

The recommended basis for admission of pupils to sight saving classes by the Illinois Society for the Prevention of Blindness is:

RECOMMENDED BASIS FOR ADMISSION OF PUPILS TO SIGHT-SAVING CLASSES

For your information—No standard for admission to sight-saving classes has as yet been adopted by the Illinois Society for the Prevention of Blindness. In the meantime, we give herewith the standards proposed by a special committee approved by the National Organization for the Prevention of Blindness in July, 1928.

1. Children having a visual acuity of 20/70 or less in the better eye after proper refraction. In addition, the following are recommended as potential candidates:

(a) Children in elementary schools having *four or more diopters of myopia.*

(b) *Inactive, subsiding (or regressive) cases, such as interstitial or phlyctenular keratitis, optic neuritis, trachoma, etc.,* in which some irritation may be present, provided the approval of the attending physician is given.

2. All cases must be considered individually.

3. Any child who, in the opinion of the ophthalmologist would benefit by assignment to a sight saving class, subject to suggestion for treatment and training by such ophthalmologist, and the acceptance of the educational authorities having charge of such classes.

4. It is assumed that all children assigned to sight-saving classes have *average normal mentality.*

Winifred Hathaway, Associate Director of National Society for Prevention of Blindness, says:

"The experiences of the twentieth century would seem to indicate that the sight saving class is the best method yet developed for educating partially-seeing children, since it approximates as nearly as possible the education of the normally-seeing. It would seem almost unnecessary to have to justify the cost of the education of any child who is educable; humanitarianism alone would seem a sufficient justification. Yet it must be remembered that the State is responsible to the taxpayers for the use of public moneys; in consequence, the State must look upon expenditures for education as an investment that will pay justifiable dividends. The object of educating partially-seeing children is the same as in the education of any group; namely, to prevent illiteracy and to develop the innate powers of the individual so that he will become an asset of the greatest possible value to himself and to the State.

"To give a partially-seeing child an even chance with the normally-seeing, it is necessary to provide him with the opportunity to overcome his handicap. In order to do this, such facilities must be at his command as will permit him to develop along the line of his greatest strength, while his weakness, in so far as this

is possible, is prevented from becoming worse."

The responsibility is largely ours in making the decision as to whether this child shall go to the School for the Blind or if sufficient vision is present and the eyes in fair condition shall go to the public school or to a sight saving class. If no sight saving class is available to you, what can be done toward having one?

Schools for the blind are doing a wonderful work and prove the great advance in civilization in the last century. The development of sight saving classes is the next forward step.

If by our combined efforts we can further a plan by means of which certain handicapped individuals may acquire an education and select a vocation as nearly along normal lines as possible, it will be well worth while.

DISCUSSION

Dr. Harry Gradle, Chicago: I trust that when this paper is published, all of you will sit down and study it carefully, because there is a great deal that is of interest to us. Dr. Adams was kind enough to send his paper and allow me the opportunity of going over it carefully. It represents a great deal of work and careful thinking on the part of a man who is in a position to study the problem, and who has a far greater comprehension of the situation that any of the rest of us.

There are two phases I wish to speak of. The first is the definition of blindness. That is a question of relativity, just as is the question of a man's financial position. Eighteen hundred dollars a year is "absolutely broke" for a man in the city, whereas in a small town he may live comfortably on that, and in the jungle he is a multimillionaire. With blindness it is the same. What is the eye to be used for and how much vision is necessary? There are four separate phases of blindness: no light perception or projection, there can be no argument about that. Economic blindness, in which the individual is so handicapped that he is unable to conduct himself in his daily routine, not able to walk about, not able to feed himself; apparently the limit is about 20/800. Below that is economic blindness. Industrial blindness on the other hand involves a different factor. For a man to be able to carry on his work the amount of vision depends on the character of the work, but it may be said that 20/360 is the limit of industrial blindness. On the other hand, for educational blindness we have a different amount of vision. For ordinary school work, a child to be able to carry on should have in his best eye corrected with glasses, 20/70. If the vision is below 20/70 that child is not able to carry on with the others, therefore he belongs in the sight-saving class. The limits of the vision necessary for the sight-saving classes are still somewhat in the air, but I can tell you that in Illinois between 20/70 and 20/200 in the best eye with correction is required.

Dr. Adams spoke at some length of the situation of the blind. Thanks to his courtesy I have recently had the opportunity to go over the inmates of the school at Jacksonville. I can speak very feelingly about this, because the children are sent there regardless of the help that might be given by an ophthalmologist. They are wished on the school and the attending ophthalmologist has no authority to reject the children because of their having too good vision, nor to institute corrective measures to restore that child to the sighted world. I think that will be changed, and that the children who come will have to pass the examination of the attending ophthalmologist, who, above all others, is capable of ascertaining whether that child should be admitted to the school or not. Again, there are too many children who could be returned to the sighted world through surgical measures, thereby saving the enormous costs of blind education.

Admission to the school has been extremely lax from the ophthalmological standpoint in the past. I believe children admitted to a school should have an examination and a certificate from a man who is a member of the Eye, Ear, Nose and Throat Section of Illinois State Medical Society. Consequently, it behooves us who examine children and give them certificates, to be more careful.

I trust you will sit down and study this paper of Dr. Adams'. I did so with a great deal of profit. It will be very much to the advantage of the Illinois Medical Society and to the blind school population of this state if you will follow out the suggestions made. I am also going to make the suggestion that the Chairman and Secretary of this Section should be authorized to collect the names of all members of the Illinois State Medical Society who have registered in the Eye and Ear Section, who are recognized as Eye and Ear specialists in the state and have that list published in the Illinois Medical Journal. There is no such list available at present.

Dr. George Francis Suker, Chicago: I think this is one of the most interesting papers presented before this Section for a long time, and Dr. Adams has given some information regarding the Blind Institution that many of us did not know. I have been particularly interested in the children in sight-saving classes in Chicago, and fully realize the difficulty in handling them. I had the opportunity and pleasure to visit Jacksonville and see the handicaps under which Dr. Adams is working, and what limitations in power and discretion the State imposes upon him. Strange as it seems, and wrong as it is, the state has no power as yet to compel the parents of minors who have very deficient or defective vision, to have that child properly treated if it has a condition that can be remedied to a certain extent, and thus prevent its going into the blind school. There should be a law not only in this state but in all states governing this situation. In the first place, these children have no voice in coming into the world, and in the second place, when they are in the world they are not the exclusive property of the parents, but are also the property of the State, economically speaking, and, this being the case the State should have the right to say that the individual should, if possible, be put into such a condition so as to be able to earn his bread and butter, or at least put it into the seeing class of children. There should be a board of competent ophthalmologists, and if they decide that a child should be operated on, the parents should be forced to have that child operated on, in a public or

private institution. It is a question to be carefully taken up by the Society for the Prevention of Blindness as well as by this Section. This Section is represented in that Society, and should present this problem for their consideration. Often the certificate of blindness as now filled out is absolutely fallacious in this State. Dr. Adams has demonstrated that beyond peradventure of any doubt. Furthermore the compensation of the blind, as now conducted in the City of Chicago, is quite ridiculous, and unfair to both applicant and state. There are people receiving $300 a year who are not industrially blind, not even economically blind. I know of a few with cataracts who could be operated on and be relieved and thus not graft on the State. I think that is a matter this Society for the Prevention of Blindness should look into, in conjunction with the Chicago Ophthalmological Society. I suggest that a committee or a number of the members of this Section be appointed by the chair to cooperate with and function with the Society for the Prevention of Blindness in these matters. It is a social as well as an economic affair, and should be conducted and managed by eye men. This Society is a private concern, not a governmental organization. And, as the Illinois Medical Society is a State affair and functions as such, it ought to be represented, and have a voice in the matter as to the disposition of these children. I suggest that the matter be looked into and steps taken to conform with the ideas I have suggested, provided the Section deems it fit and proper.

Dr. L. R. Mellin, Chicago: The preceding speakers have all mentioned "What is blindness?" The Industrial Act of the State of Illinois gives 20/200 as industrial blindness, and such an individual receives compensation for total loss of vision. This unscientific figure is unjust both to the employer and employee and should be corrected. I think it behooves this body to adopt a resolution and send word to proper officials of the state recommending that the standards adopted by the American Medical Association be considered as standard in determining industrial visual efficiency.

Dr. G. H. Mundt, Chicago: Bad as the condition is in the State of Illinois, many of us know that it is much worse in some other states as to the percentage of loss of vision. All of us will admit that 20/200 is not properly an industrial blindness. In the state of New York they will rule that a man who has 20/30 vision has two-thirds; 20/50, two-fifths. That is the way they settle their claims in the state of New York.

We should be very politic in the handling of this matter. If we are going to try to get revision of this thing we should be cautious. I will say one thing, I believe ophthalmologists are to a considerable extent responsible for their own difficulties. I notice that practically every man who reports vision gives it as 20/50's or 20/200th. We should not report vision as fractions. If we do the layman is justified in thinking we know what we are talking about, and if a man has 20/30 he has two-thirds. I think we should be pretty cautious in throwing anything more into the Industrial Board than we can help. Right now, it is dangerous.

Dr. Harry Gradle, Chicago: I do not agree with Dr. Mundt that it is dangerous at all. Our compensation laws so far as ophthalmological work in this state is concerned are hopelessly inadequate, out of date and unscientific. So far as I know, and I speak with paternal pride, the compensation tables adopted by the American Medical Association are as nearly a fair and scientific method of adjusting compensation as they can be made today. Sixteen states have adopted this method. A fair share of insurance companies are working with this table as a basis. There is no reason why we have to handle an outrageous situation with kid gloves. It is perfectly true that we are in this situation through our own fault, but that is no reason why we should not try to get out of it. I am in sympathy with the idea that we endeavor to bring about a modern estimation of compensation in this state, and I would like to second Dr. Mellin's motion.

Dr. L. R. Mellin, Chicago: I have done some little eye work in connection with some insurance companies in Chicago, and have had contact with the last Industrial Commission and also the present one. The present one is a very fair-minded body, and is looking into the situation quite intelligently, and they have spoken to me on some of these matters. I know the Governor himself has expressed a desire to revise the present statutes, not only in relation to the eye. I do not think it is a question of being politic, and I do not think the medical profession in dealing with medical questions has to be politic.

THE AD-MAN LOOKS AT LOVE

Birth control is today one of the facts of American life. It is practiced, or at least attempted in some form, almost universally.

But the laws remain on the statute books. The shadow of the taboo remains, and in this shadow the advertising "profession" operates what is probably the most flourishing racket in America, now that Capone is in jail and legal beer is imminent.

In the files of Consumers Research I counted leaflets advertising some fifty different antiseptics and other contraceptive products, and in the files of the National Committee on Maternal Health, some fifty more. Neither organization attempts to list them all; the total probably runs into thousands. Each is represented to be a convenient, safe and reliable contraceptive. Meanwhile, the gynecologists of the world are patiently searching for precisely such a thing and say they haven't found it.

In the earlier stage of feminine hygiene campaigns the language of the ad-men was full of euphemisms, of indirection, of tender solicitude for the sad-eyed wives pictured above such captions as "The very women who supposed they knew are grateful for these enlightening facts." But recently the pressure of competition has speeded up the style. "Now it can be told," they declaim, and "Why Mince Words?"

Some of them don't; for example, the ad-man for Pariogen tablets, who writes the following chaste communication, addressed presumably to the automobile trade:

"Pariogen tablets may be carried anywhere in a purse, making hygienic measures possible almost anywhere, no other accessories or water being required."

—James Rorty, in *Common Sense.*

EARLY CARE OF PARALYSIS FROM ACUTE ANTERIOR POLIOMYELITIS*

An Analysis of the Program in Twenty-two Orthopaedic Clinics and Hospitals

EDWARD L. COMPERE, M.D., AND
MARGARET S. CAMPBELL, R.N.
CHICAGO

The care of the paralyzed patient during the period just following the acute stage of an attack of anterior poliomyelitis has been emphasized in text-books and treatises, most of which were written by and for orthopaedic surgeons. Almost all of these surgeons agree that the most important consideration is protection of the involved extremities and prevention of deformities. Methods and the value of supportive measures have been debatable issues. Legg and Merrill,[1] Todd,[2] and Porter[3] have quite recently published treatises which emphasize some of the principles of treatment advocated in this clinic. In the hope that we might receive some valuable suggestions for the care of our own patients, a brief outline of the procedure followed in the Orthopaedic Division of the University of Chicago Clinics was sent to the Chairman of some of the larger orthopaedic services with a request for criticism of our program and discussion of procedures found helpful in their own clinical experience. Replies were received from the following orthopaedic surgeons:

Dr. Fred Albee, New York, N. Y.; Dr. Willis Campbell, Memphis, Tenn.; Dr. Frank Dickson, Kansas City, Mo.; Dr. F. J. Gaenslen, Milwaukee, Wis.; Dr. Wm. Edward Gallie, Toronto, Canada; Dr. R. I. Harris, Toronto, Canada; Dr. Vernon L. Hart, Dayton, Ohio; Dr. M. Henderson, Rochester, Minn.; Dr. R. A. Hibbs, New York, N. Y.; Dr. Michael Hoke, Warm Springs, Georgia; Dr. Frederick C. Kidner, Detroit, Michigan; Dr. C. Leroy Lowman, Los Angeles, Calif.; Dr. Leo Mayer, New York, N. Y.; Dr. John R. Moore, Philadelphia, Pa.; Dr. Frank Ober, Boston, Mass.; Dr. Robert B. Osgood, Boston, Mass.; Dr. Charles W. Peabody, Detroit, Mich.; Dr. John L. Porter, Evanston, Illinois; Dr. Robert D. Schrock, Omaha, Nebraska; Dr. Arthur Steindler, Iowa City, Iowa; Dr. George Wagoner, Philadelphia, Pa.; Dr. Royal Whitman, New York, N. Y.

The procedure in the University of Chicago Clinics which was submitted for review was planned to include four periods of treatment. Each phase of the early care of the paralysis as practiced in this clinic is submitted here, together with a summary of the replies received from the above named surgeons.

University of Chicago Clinics

1. *Immediately after the acute illness has subsided and further spinal punctures are unlikely, a plaster of Paris cast is put on including all parts of the body which show any suggestion of involvement. This frequently includes a complete body and bilateral leg cast while the arms are placed in a position of abduction and external rotation. This complete immobilization is maintained for a period of from four to six weeks.*

NOTE: Cast is usually bivalved within a week after application and used as plaster splints or shells.

Comments: Of the twenty-two replies to the questionnaire, all were in agreement with the general principle of early protection of the weakened extremities and attempts to promote rest and relaxation. Only ten of the twenty-two stated that they used casts or plaster shells and three of the surgeons felt that any attempt to splint the limbs was useless.

The following orthopaedic surgeons stated that their initial plan of treatment coincided with this outline: Drs. Albee, Campbell, Dickson, Henderson, Hibbs, Moore, and Schrock.

Some additional suggestions or variations in methods included:

Dr. Gaenslen:—"While plaster cast immobilization has been frequently advised, especially the plaster bed advocated by Lange, I have not used it and doubt if there is real advantage."

Dr. Gallie:—Splinting is recommended and "In some cases it is undoubtedly useful but in many it proves worthless since the deformities develop in spite of the wearing of both night and day splints."

Dr. Harris:—"I do not use plaster unless the problem of fixation is such that it cannot be solved by simpler means and this is rare. Relaxation of paralyzed muscles is the aim to be striven for, not absolute fixation."

Dr. Hart:—"During the tender phase, which, in our group of patients has averaged a period of four to six weeks, we remove the fixation apparatus once daily and place the child beneath warm water in the ordinary bath tub. During this phase, we do not apply massage and we do not attempt to test the degree of paralysis in the affected extremities. While under water, the child is encouraged to actively move the various joints within the limits of pain. It has been our experience that the daily warm bath tends to shorten the tender phase and aids in the prevention of contractures."

*From the University of Chicago, Department of Surgery, Division of Orthopaedic Surgery.

Dr. Hoke:—Questions the advisability of long periods of complete immobilization in plaster casts. "There is quite a bit of turmoil to the patient in having a double spica applied; it means quite a bit of handling. Applying a plastic splint to an extremity, with the idea of holding the extremity in a neutral position, is not much tax on a patient, and is, of course, in order."

Dr. Kinder:—"I prefer Bradford frame and plaster shells or wire splints."

Dr. Lowman:—"In the first place I would suggest the immediate use of splints, either short or long legged, preferably long, with very slight slacking off at the knee, about five degrees, to give the patient comfort. If he is in a good deal of pain and there is difficulty in controlling the muscle spasm, then plaster casts can be put on and bivalved early."

Dr. Mayer:—"There is one feature of treatment which I should like to recommend to you and that is the application of *balanced traction.* Plaster shells are made as supports for the lower and upper extremities. These have hinges at the knee and ankle and are so arranged that they can be suspended from a Balkan frame. Even with minimal strength in a muscle, it is possible if the limb is properly balanced to have the patient perform motion in all directions. This we find adds considerably to the rapidity of recovery.

Dr. Ober:—"It is only rarely that we apply plaster casts for extensive paralysis. The application of a cast for extensive paralysis usually takes so much out of a child and increases its tenderness so much that we have always thought it was detrimental."

Dr. Osgood:—"We bivalve the plaster casts as soon as they have set since we think their only purpose should be to retain the limbs in such position as to prevent deformity, but not perhaps to absolutely completely immobilize. I think the atrophying effect from a complete cast is greater than from a cast in which there is at least a little possibility of movement and the disturbance of circulation is still greater from a complete cast left on four to six weeks. It is often a comfort also in the earlier stages to be able to apply heat either by baking, hot water bottles or electric pads."

Dr. Peabody:—"Personally I am very much convinced that during the subacute phase every effort should be made to eliminate ascending stimuli (which may travel through motor as well as 'sensory' pathways) and nothing does this so well as heavily padded plaster, as well as conserving heat."

Dr. Porter:—"This is the stage when nursing care and splinting are most important, and mild, gentle massage may be begun. It is during this early stage that two things must be borne in mind—the danger of fatigue and of contractures."

Dr. Steindler:—"Casts are rarely applied during the acute and subacute stage. Recumbency in involvement of the lower extremities continues, according to severity, from six weeks to four to six months."

Dr. Wagoner:—"The affected part or parts are immobilized by plaster shells, not casts, with the affected muscles in the position of maximum relaxation. The use of splints or shells are found to be better than a solid or circular cast as they permit more careful watching of the skin. At this period external heat is constantly maintained through the medium of a cradle illuminated with electric bulbs, preferably those with carbon filaments."

Dr. Whitman:—"It would appear that fixation of the spine during the inflammatory stage might be indicated since movements of the trunk often cause pain."

Todd[2] states that "In the acute stage of infantile paralysis, complete rest and relaxation of the affected muscles constitute the one and only indication in treatment as far as the orthopedic aspect of the case is concerned. Massage and electrical stimulation are undoubtedly valuable in the later, more chronic, stages of the complaint, though even there they are of less relative importance than the continuous protection of the damaged muscles by relaxation in appropriate appliances. If one had to choose, at any stage of infantile paralysis, between efficient splintage and any other method of treatment, the preference should undoubtedly be given to splintage." We disagree only with the suggested use of electrical stimulation.

University of Chicago Clinics

2. *Physiotherapy is started. As long as there is persistent cutaneous "stroke tenderness" this treatment is confined to warm salt baths. The patient is allowed to move about under the water (observations can be made as to the muscle power) but muscle reeducation with definite ex-*

ercises is not begun until cutaneous tenderness disappears.

Comments: Agreement with no additional suggestions or changes in procedure: Drs. Albee, Campbell, Dickson, Gaenslen, Henderson, Hibbs, Kidner, Mayer, Moore, Osgood, Peabody, and Schrock.

The following were additional suggestions made by the ones indicated:

Dr. Gallie:—"My general impression is that massage is useless and that prolonged and expensive treatment in the form of muscle re-education, exercises in salt water and so on ends up with about the same result as if patient had never been treated at all."

Dr. Harris:—"Though I use physiotherapy, I am not greatly impressed with its value. Relaxation of the paralyzed muscles is the most important form of treatment by long odds."

Dr. Lowman:—"During the first week we make a very careful test of all the muscles to determine the extent of involvement, check the kidney condition, which in many cases shows nephritis, and commence physiotherapy, the type and amount being determined by these findings. Of late years, when the case is a mild one, we have been starting them in the new under water gymnasium for pool treatments as early as the middle of the 4th week. Probably a high percentage of the cases are started in the 5th week.

"We consider the skin tenderness and muscle soreness as a guide and always make an effort not to produce any pain, depending upon the patient's voluntary efforts for the movements."

Dr. Ober:—"No physiotherapy is started until all the tenderness has disappeared, and that means deep tenderness, and the best test for deep tenderness, in my experience, is passive straight leg raising. During the tender stage patients are put in warm baths and allowed to move as much as possible without any assistance."

Dr. Porter:—"Begin massage very guardedly, as too much massage is as fatiguing as exercise."

Dr. Steindler:—"Physiotherapy and under water muscle training is started with the disappearance of the sensory symptoms, two weeks to two months after onset; same is true of muscle re-education."

Dr. Wagoner:—"Approximately three weeks following the onset of the disease the patient is started on daily hydrotherapeutical treatments consisting of immersion in hot salt water of a temperature approximating that of the body and of specific gravity equal to that of sea water. Neither active nor passive motion is permitted at this time; the duration of immersion is gradually increased from five minutes to an hour. After the disappearance of cutaneous tenderness, gradual passive motion is instituted. Following the daily baths the affected parts are replaced in their shells or splints and the external heat is maintained."

Dr. Whitman:—"I think massage and exercise may be deferred until the stroke tenderness has disappeared."

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3. *Muscle re-education is given at first under water with light massage after the bath. This is very carefully supervised and every precaution is taken not to fatigue any muscle group. During this period the affected extremity is supported either in plaster shells or metal splints and the patient is kept upon a Bradford frame. The apparatus should be removed for a period each day and the patient's position changed, so that full range of joint motion may be maintained.*

Comment:

The following replies were in agreement and suggested no additions or changes in procedure: Drs. Albee, Campbell, Dickson, Henderson, Hibbs, Hoke, Kidner, Mayer, Moore, Osgood, Peabody, Schrock (emphasized that they must be comfortably splinted), and Wagoner.

Additional suggestions were made as follows:

Dr. Gaenslen:—"I would not favor the Bradford frame as a proper mattress is more comfortable and allows the slight shifts in position which, I am sure, contribute to comfort more than unusual convexity of the frame."

Dr. Harris:—"I concur in this though I do not think under water exercises very important except for the psychic effect upon the patient and parents."

Dr. Lowman:—"It has been our experience that the patient is quite drowsy after a period in the warm water, and I believe that in most instances if the patient can take advantage of this relaxation and have a period of rest and sleep following such a treatment it is of much more benefit than the massage. If such a treatment

is given as a heat treatment preliminary to muscle re-education, that is a different thing, but in the early cases, I feel that it would be just as well to be quickly dried off and allowed to sleep for an hour."

Dr. Ober:—"Until the disappearance of deep tenderness, patients at the Children's Hospital are put in the tank and allowed to move themselves."

Dr. Porter:—"As soon as paralysis is stationary begin muscle exercises and education, *not before.*"

Dr. Steindler:—"Muscle re-education both under water and on plinth; initial care should be exercised; splinting must be rigorously maintained, outside of treatment periods."

Dr. Whitman:—"The prevention of deformity is of far greater importance than exercise."

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4. *Muscle re-education is begun from two to three months after the onset of the disease. When deep tenderness has disappeared, the program of exercises can be given alternately on a table and in the water, gradually increasing the treatment in accordance with the patient's tolerance. The massage can then be somewhat deeper than at the beginning. This treatment is continued as long as there is evidence of improvement, usually from one to three years.*

The following replies were in agreement with the outline of the fourth phase of treatment: Drs. Albee, Campbell, Dickson, Gaenslen, Henderson, Hibbs, Hoke, Mayer, Moore, Osgood, Schrock, Steindler, and Wagoner.

The additional suggestions or variations in methods included:

Dr. Gallie:—"When the stage of tenderness is over we allow the patients to start in to use their muscles as much as they will."

Dr. Kidner:—"I agree in general but feel that the first section is unnecessarily rigid."

Dr. Lowman:—"We have concluded, after many years of experience, that the second six weeks of convalescence is the most vital part of the whole treatment period. It is during this time when atrophy from disuse sets in in the trunk muscles, particularly. The inherent objection to muscle action produced by pain and muscle spasm undoubtedly assists in this process of atrophy. It is during this time that a knee, unless absolutely controlled, tends to show the early aspects of stretch palsy,—which would be aggravated by the full joint range just spoken of."

Dr. Ober:—"There is no set time at which muscle re-education can be commenced. If the deep tenderness lasts for six or eight months, muscle re-education is not instituted until after that has entirely disappeared. The water exercises are better for those patients who are severely paralyzed. Those with mild paralysis do not need to go in water at all. No massage whatever is given during tenderness. Improvement continues indefinitely. I have had a shoulder deltoid come back five years after the onset of the paralysis."

Dr. Osgood:—"We occasionally begin some form of muscle re-education before all cutaneous tenderness disappears but not in the region where the cutaneous tenderness exists; usually not in the same limb where the cutaneous tenderness exists. We are often able, therefore, to begin muscle re-education at the end of a month and we do not always delay it over the two or three months that you suggest. Each case must be a law unto itself, of course."

Dr. Porter:—"As soon as active use of the paralyzed member is permitted, braces must be devised and prescribed for each case."

Dr. Steindler:—"Muscle re-educational training is started about the same time as exercises are graded; also massage, until no further traces of improvement."

Dr. Wagoner:—"With the disappearance of 'deep pain,' muscle education is started along the manner outlined by you. Usually about four months after the onset of the disease we are able to fit the individual with braces and make him ambulatory, unless of course, the paralysis is too extensive. The use of electricity in muscle re-education has been abandoned."

Dr. Whitman:—"I am inclined to think that voluntary use of protected limbs is more important in the regeneration process than muscle training. This is important chiefly because it keeps the patient under constant observation and if it does not widen to much expense of time and money it may be advisable."

Several of the orthopaedic surgeons to whom this outline was submitted added additional information in discussing the length of time after the onset of acute poliomyelitis with involvement of the lower extremities that weight bearing was permitted. There was almost uniform

Outline of Opinions on the Early Care of Infantile Paralysis

Comment	Name	I Complete immobilization of involved trunk or extremities	II Begin active movement under water	III After stroke tenderness disappears increase under water exercise and add light massage	IV After deep tenderness disappears increase exercise and massage to patient's tolerance
"Approve in every particular."	Albee, Fred	Agrees	Agrees	Agrees	Agrees
"Concur absolutely." Suggestion on active function.	Campbell, Willis	Agrees	Agrees	Agrees	Agrees
"Correspond exactly to our ideas."	Dickson, Frank*	Agrees	Agrees	Agrees	Agrees. "We generally allow weight bearing at the end of," etc.
	Gaenslen, F. J.*	Does not use plaster cast	Agrees	Prefers the Bradford frame to splints at this stage.	Agrees
	Gallie, W. E.*	Uses splints to "prevent contracture of recovering muscles and stretching of more paralyzed ones."	Uses water treatments at Children's Hospital but not impressed with it.	Believes that massage is useless.	Permits patients at this stage to use muscles as they will.
	Harris, R. I.*	Prefers relaxation of muscles to absolute fixation.	Uses this but not greatly impressed with it.	Agrees. Believes psychic effect is important.	Agrees.
"Essentially the same as we apply in our department."	Hart, Vernon L.*	Uses either plaster splints or Bradford frame.	Agrees	Agrees	Agrees
"I agree with everything in principle."	Henderson, M.	Agrees	Agrees	"I believe that the muscle education can be started as soon as the tenderness has left, but one, of course, must be guided by the patient's tolerance."	
"Plan excellent, nothing to contribute to it."	Hibbs, R. A.	Agrees	Agrees	Agrees	Agrees
	Hoke, Michael*	Objects to prolonged complete immobilization.	No comment	Agrees	Agrees
	Kidner, Frederick C.	Prefers Bradford frame and plaster shells or wire splints.	Agrees	Agrees	"I agree in general but feel that the first section is unnecessarily rigid."
	Lowman, C. Leroy*	Prefers splints	Emphasizes need to avoid stretching of involved muscles.	Careful not to produce pain. Active movements only.	Exerts care to avoid stretch palsy.
"Corresponds in most of details with that followed by me."	Mayer, Leo	Agrees	Agrees	Recommends—"Balanced traction."	Agrees
"Routine concurs with yours and can offer no suggestions."	Moore, John R.	Agrees	Agrees	Agrees	Agrees
	Ober, Frank*	Objects to cast for extensive paralysis.	Agrees	Active movement only until deep tenderness disappears.	Concurs, but emphasizes that "no massage whatever is given during tenderness."
"In essential accord."	Osgood, Robert B.*	Bivalves cast early. Advocates heat for involved limbs.	Agrees	May begin exercises before cutaneous tenderness disappears but not in the region where the cutaneous tenderness exists.	May begin muscle re-education in certain extremities at the end of a month.
Agrees with principles	Peabody, Chas. W.*	Agrees	Agrees	Agrees, with additions	Agrees
Agrees in general.	Porter, John L.*	"Rest is most important."	Permits tub bath in warm salt water.	Agrees with principle.	Warns against muscle fatigue.
	Schrock, Robert D.	Agrees	"Good"	Must be comfortably splinted.	"Excellent."
Agrees with the principles outlined.	Steindler, Arthur*	"Casts are only rarely applied."	"I agree with your method of treatment."	"Yes, but splinting must be rigorously maintained outside of treatment periods."	"Essentially identica with yours."

*For detailed answers see text.

Outline of Opinions on the Early Care of Infantile Paralysis—Continued

Comment	Name	I Complete immobilization of involved trunk or extremities	II Begin active movement under water	III After stroke tenderness disappears increase under water exercise and add light massage	IV After deep tenderness disappears increase exercise and massage to patient's tolerance
	Wagoner, Geo.*	"Plaster shells, not casts with the affected muscles in the position of maximum relaxation."	Advocates hot salt water baths but neither active nor passive motion.	Agrees	Agrees, with additions.
Your routine "concensus of opinion."	Whitman, Royal*	Agrees	"Massage and exercise may be deferred until the stroke tenderness has disappeared."	"The prevention of deformity is of far greater importance than exercise."	"Voluntary use of protected limbs is more important in the regeneration process."

agreement that this should be deferred until several months had elapsed.

Dr. Campbell:—"You did not mention just when you begin active function, as weight-bearing and active use of the upper extremities without support. We usually do not begin any weight-bearing until after the elapse of six months time, and then, of course, with the proper apparatus, which should be as light and as little as possible. In the upper extremity, we do not leave off support until the individual can actively use the parts to some extent; for instance, the shoulder should be abducted by voluntary movement to about 90°."

Dr. Dickson:—"We generally allow weight bearing at the end of three months and prefer braces at this time to rigid supports, but otherwise I have nothing to add to what you do."

Dr. Harris:—"You make no mention of the important problem of when weight bearing should be permitted and what safeguards are necessary to prevent or minimize deformities. I think this much more important than physiotherapy."

Dr. Lowman:—"Many Doctors, because they know that continuous bracing tends to make atrophy encourage patients to get along without braces, and by so doing encourage overstretch palsy, allow the patient to carry a very high degree of motor and organic strain due to increased work, and do not realize that there is a happy medium."

Dr. Peabody:—"There may be some advantage in determining as early as possible the probable major residuals, and adapting fixation to put the weaker groups in maximum relaxation. Thus in lower extremity it may be preferable in the particular case to put the foot in equinus and the knee in flexion or the hip in abduction."

Dr. Porter:—"With the active exercises and muscle training encourage independence. Never give up. Some patients remain in bed because they cannot get out alone, but with braces might walk when once upright, and there are comparatively few cases that cannot be taught to get out of bed or out of a chair alone."

Dr. Wagoner:—"Usually about four months after the onset of the disease we are able to fit the individual with braces and make him ambulatory, unless, of course, the paralysis is too extensive.

"Approximately eighteen months following the onset of the disease preliminary operative procedures are instituted. These chiefly are along the line of stabilizations and muscle and tendon transplants. It is interesting to note that we are now successfully performing stabilization operations on *children from four years of age up*. We have not succeeded, however, in obtaining satisfactory results in arthrodeses of shoulder joints in children under fourteen years of age; this constitutes, probably, the only exception to the early use of fusion or arthrodesis operations."

A study of the replies and criticisms received has been a help to us and has given us more confidence in caring for these patients. The concensus of opinion confirms our belief in the principles of protection and a conservative program of exercise and muscle re-education.

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DIFFERENTIATION OF BRONCHOGENIC CARCINOMA FROM MEDIASTINAL TUMOR*

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My purpose in presenting this paper is not to discuss mediastinal tumor, primarily, but to use the case to be presented as one of the problems in differential diagnosis of lung diseases, especially some of the problems in the differential diagnosis of primary lung cancer. Bronchogenic carcinoma seems to be increasing in importance, since an increased incidence has been reported during the past ten years, both by clinicians and pathologists. Accuracy in the diagnosis of chest diseases is not only desirable but of practical importance with particular reference to the type of treatment to be used. Tuberculosis is amenable to treatment, and the diagnosis usually carries with it a favorable prognosis, while primary lung and mediastinal malignancies are progressive, ending fatally. Modern diagnostic methods should eliminate these errors to a minimum.

The symptoms, physical and x-ray findings are being correlated from the increasing numbers of lung cancer being reported, with the hope that a definite diagnostic picture may be established.

Incidence of Lung Tumor. Primary lung cancer is the most frequent malignancy encountered in the lung and is shown to be on the increase. Older clinicians rarely, if ever, made a diagnosis of primary lung tumor and the pathologists considered the disease as rare. Post mortem statistics of recent dates compared with older figures has led to the conclusion that bronchogenic carcinoma is on the increase. "Barblinger"[7] by analyzing his material found that in the years from 1910-1914 the condition occurred in 2.2 per cent, and from 1919-1924 it rose abruptly to 8.3 per cent. The Peter Bent Brigham Hospital[9] in Boston, reported seven cases 1913-1927, inclusive, and 16 cases 1928-1929, inclusive. These increases are probably more apparent than real, as our diagnostic methods have markedly improved since 1910 or 1913. B. M. Fried[1] Med. Dec. 1931: "The author is of the opinion that the more frequent occurrence of this disease in recent years, as compared with older findings, can be explained on the basis of the following factors: 1. Improved clinical and pathological methods of diagnosis; 2. Increased attention to this malady, and, 3. Increase in the span of human life (a much greater proportion of the people reach the cancer age)."

The increase, then is very likely more apparent than real.

Symptoms. Tumors of the mediastinum and lung produce symptoms chiefly by pressure, which vary as to location and size of tumor. New growths in the anterior mediastinum frequently, by pressure, cause obstruction to the venous return; posterior mediastinal tumors cause pressure upon the trachea, esophagus and adjacent nerves, and those tumors (usually bronchogenic carcinoma) which extend from the lung or pleura cause symptoms according to location and size. Obstruction to the superior vena cava causes many of the symptoms of mediastinal tumors, namely cyanosis, edema of face and neck, dilatation of superficial veins, and dyspnea. The edema of the head and neck is most prominent, with relatively slight swelling of arms and hands, which Milles[4] states, is probably the result of the auxiliary effect of the voluntary muscles in propelling the blood through the veins. The edema likewise varies as to posture and is associated with dilatation of the superficial veins.

Cough may be caused by obstruction to the trachea and bronchi from within or without, and the involvement of the recurrent laryngeal nerve. Dyspnea and orthopnea may be caused by obstruction to the trachea, or the bronchi of one or more lobes, to accumulation of fluid in the pleural space, or to stenosis of the superior vena cava. The obstruction to the superior vena cava is more frequently caused by tumors in the mediastinum (arising from the thymus, substernal medullar thyroid, carcinoma of substernal thyroid, fibroma and sarcoma) and frequently by extension of bronchogenic carcinoma into the mediastinum. Hemoptysis is due to bronchial or tracheal involvement which may be produced by obstruction from within or without, usually, of course, associated with some secondary infection. Pain is not characteristic or constant and depends upon location and extent of the growth. Pleural effusions are usually found in late lung

*Read before the Section on Medicine of the Illinois State Medical Society, Peoria, May 16, 1933.

tumor cases but not so frequently in mediastinal tumors unless there are metastases to the lung or pleura. Many cases of bronchogenic carcinoma as well as mediastinal tumors may be symptomless, at least in the beginning. The first manifest signs and symptoms may be of the metastasis. The lymph nodes, liver, bones, lungs, brain and kidneys are the most frequent sites of metastasis. B. M. Fried[1] has reported 47 cases of bronchogenic carcinoma with 16 having metastasis to the central nervous system, and 13 of the 16 cases were diagnosed as brain tumor.

Definite symptoms and signs in primary tumors of the mediastinum and lung have not been correlated. Rogers[5] lists some of the leading findings in primary lung cancers: 1. Shrinkage of the affected side; 2. The presence of an infiltrating process, most often in the hilar region, showing a marked tendency toward peribronchial infiltration; 3. The presence of a bronchial stenosis characterized by a partial or complete atelectasis of the affected portion of pulmonary tissue; 4. Retraction of the heart and mediastinal contents toward the affected side; 5. Upward retraction of the diaphragm on the affected side; 6. In from 7.5 to 10 per cent, evidence of palsy of the phenic nerve (more often left sided), with paralysis of the corresponding side, and an accompanying paradoxical respiration; 7. Widening of the mediastinal shadow. The x-ray is of the most value in the differential diagnosis of chest diseases. Paleviski states that a diagnosis of lung cancer may be made from the history and physical findings.

Diagnosis. Diagnosis of primary lung or mediastinal tumors may be made by exclusion, with suitable x-ray and clinical laboratory data (when the material may be made available for examination). Tuberculosis may usually be differentiated by repeated sputum examinations, history, and x-ray findings, although bronchogenic carcinoma may be superimposed upon pulmonary tuberculosis. History, physical findings and laboratory examination should rule out syphilis and other infections of lung and mediastinum. A differentration of the type of tumor may be difficult unless cancer cells are found in pleural fluids, material obtained by puncture of the lung itself, from sputum, by sections of available envolved lymphnodes, or by biopsy from material obtained thru the bronchoscope.

Given a patient with pulmonary symptoms who is in the cancer age, who has a negative history for tuberculosis, has had repeated negative sputum examinations for tubercle bacilli, with a lesion starting at or near the hilus, with peribronchial infiltration, and retraction of the mediastinum toward the affected side, a probable diagnosis of bronchogenic carcinoma may be made.

CASE REPORT

Patient is male, forty-one years of age, married and by occupation a salesman. He was well until in February, 1931, when he became suddenly ill in a Philadelphia hotel with chills, fever, generalized aching, cough and expectoration. A house physician noted he had a temperature of 104°, and diagnosed his illness as influenza. It was necessary for him to remain in the hotel for 4 or 5 days, before he could return home. The cough continued, although he felt well except he tired easily. His condition remained the same until in September, 1931, when he consulted a physician because of blood spitting. An x-ray of his chest showed a fan shaped area of increased density which radiated from the hilus into the upper right lobe. The patient was hospitalized for 2 or 3 weeks, with the probable diagnosis of tuberculosis, although no tubercle bacilli were demonstrated in the sputum. He was discharged as improved; was apparently well until January, 1932, when he again expectorated blood, and he then entered a tuberculosis sanatorium, where repeated sputum examinations failed to demonstrate tubercle bacilli. Patient had complained of pain in the region of the right shoulder, and after four or five days in the sanatorium, had a rather large hemoptysis which was repeated several times. He could not lie flat in bed because of dyspnea and because of dizziness. Edema of neck and face was noted which changed from side to side depending on position. He was then transferred to a general hospital. Swelling of the neck and face became more marked, difficulty in breathing was more noticeable, had to sit up in bed. The paroxysmal cough was more marked and distressing. The right upper portion of the chest was flat to percussion which extended 2 or 3 cm. to the left of the left border of the sternum. The breath sounds over this area were diminished, no rales heard, the left border of the heart was within the midclavicular line; flatness, diminished breath sounds in right lower chest, with a positive Grocco's sign on left. Fluid aspirated was straw colored, containing small amount of blood, few leucocytes and lymphocytes—no organisms found—culture negative. Microscopic examination of the centifuged sediment did not demonstrate malignant cells. A few large oval cells (no opinion can be expressed as to malignancy) were found in material aspirated from upper right lobe of lung. Patient had a slight elevation of temperature but not daily except about 10 days before death when an area of bronchopneumonia was noted in left lower. No abnormal

findings were noted in abdomen on entrance to hospital but the liver was found to be about three fingers below costal border three or four weeks before death. Patient shortly before had complained of pain in upper right quadrant and in region of the right hip.

The pupils were equal but somewhat dilated, reacted to light and accommodation, eye grounds were normal, there was a marked edema of neck, face and eye lids with marked dilatation of veins extending down to about the angle of Lewis. A number of supraclavicular lymph nodes were palpable—one was removed for section but malignant tissue was not demonstrated.

Laboratory examinations were not of much help in diagnosis, except x-ray. April 7, 1932, R. B. C.—4,550,000 with 85% Hb. Dare. May 18, 1932, R. B. C. —3,460,000 Hb. 60% Dare. Differential count was essentially normal except shortly before death when a slight increase in neutrophiles was noted. Blood urea —14.010, April 7, 1932. Kidney function 55%. Sputum—negative for tubercle bacilli on various occasions. Sputum was somewhat gelatinous at times, was never examined for malignant cells. Urine, April 7, 1932: Albumin, trace. Few pus cells. April 18, 1932, Albumin 4 Plus, Blood 4 Plus. Kahn and Wassermann tests on blood serum-negative. Patient was treated with deep x-ray herapy without results, although treatment was started late in the disease.

COMMENT

The case illustrates the difficulty in differentiating bronchogenic carcinoma, and is of interest because the infiltrative process from the hilus initiated the early symptoms, later causing obstruction of the superior vena cava and obstruction to the right upper bronchus, causing a complete atelectasis of the right upper lobe.

X-RAY REPORT

Films taken, September 24, 1931, show a dense fan-shaped shadow radiating from the right hilar region upward and outward into the upper lobe of the right lung. The outline is irregular, indistinct, and feathery. The appearance is not that of an exudative condition, but rather a fibrotic one, suggestive of a healing infarct or a healing tuberculosis.

The diaphragm is regular on both sides. The heart and aorta are within normal limits. The trachea is located in the mid line. There is no free fluid in either pleural sac. There is some dilatation of the lower bronchioles in the lower right lobe.

Examination, April 8, 1932, shows a complete obliteration of the right upper lobe with the condition limited entirely to the lobe and completely involving it. There is fluid in the right pleural sac, and the lower lobe on the right shows a diffuse haziness probably from perivascular exudation. The trachea at this time shows no deviation and there is no narrowing of the lumen of the main bronchus; however, it does seem narrowed.

Some lymph glands in both supra-clavicular spaces can be seen.

The x-ray findings are suggestive of some form of lesion (tumor) causing a progressive bronchial obstruction by pressure and resulting massive collapse, or possibly an involvement of the entire lobe by a tumor mass. I am more inclined to favor the former.

Apparently, however, there is neither an increased nor decreased pressure, judging from the absence of any displacement of trachea or mediastinum, and this fact makes a differential diagnosis impossible without further information.

AUTOPSY

A limited examination of the body was made. The sternum was removed with difficulty because the anterior mediastinum was adherent. There was approximately 1000 to 2000 cc. of straw colored fluid in the right pleural space and approximately 1000 cc. in the left pleural space. Pleural surface of right upper lobe was adherent and could not be stript without tearing. There was no crepitation in right upper lobe; the lung was rather dark in color with several hard white nodules in the pleura both on the mediastinal side near the hilus and on the axillary side. A complete atelectasis of right upper lobe was found, with constriction of the right upper bronchus near the hilus, by white hard tumor masses which surrounded the bronchus and trachea. Section of upper right lobe did not demonstrate any tumor masses in the bronchus itself; a bronchitis was found. The tumor mass extended up into neck, surrounded the vessels of the mediastinum and partially constricted the superior vena cava to about ⅕ its normal size at a point shortly above its entrance into the right auricle. The tumor mass occupied most of the anterior mediastinum.

Metastases were likewise found in the liver and kidneys. The brain was not examined. The upper portion of the left lower lobe showed an area of bronchopneumonia. The kidneys were not opened, but were enlarged with white hard nodules in the parenchyma. The heart did not show any gross pathological changes. The skull was not opened.

TISSUE EXAMINATION FROM MATERIAL REMOVED IN AUTOPSY

Lung: The tissue is composed of a dense more or less hyalinized fibrous stroma, in the large meshes of which are well-stained, round to ovoid cells, and in areas spindle cells having a poorly defined cytoplasm. The nuclei are vesicular. There is but little intercellular substance associated with these cells. They are not clearly defined from the stroma, and occasional areas of central necrosis is seen. Some of the cells reach a large size, while there is seen a considerable number of mitotic figures. Small blood vessels are moderately abundant, and at some points the tumor cells themselves appear to form vascular channels.

Liver: The liver parenchyma has been replaced in areas, poorly defined, by a collection of round to ovoid tumor cells. The latter have vesicular nuclei, granular cytoplasm, and show a tremendous number of mitotic figures. These areas contain a moderate number of delicate blood vessels.

Diagnosis: Round cell sarcoma with metastasis to liver.

CONCLUSIONS

1. Lesions of upper lobes of lung should not be diagnosed tuberculosis, unless confirmed by proper x-ray interpretation or by finding tubercle bacilli in sputum.

2. All brain tumors should have x-ray examination of chest before operation, to rule out bronchogenic carcinoma.

3. Bronchogenic carcinoma does not give a definite clinical picture, at least pathognomonic signs and symptoms have not been correlated, to date.

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DISCUSSION

Dr. Herman Cole, Springfield: Dr. Newcomb's paper does not leave very much to discuss because it covers the ground very thoroughly. I have only one or two small points to emphasize.

The incidence of these tumors seems to be on the increase. However, I feel that by obtaining more autopsies in the last few years and by the better feeling of the lay people toward autopsy during this time we have brought to diagnosis a good many cases that would otherwise have been diagnosed as tuberculosis or bronchiectasis. Most of the cases I have seen have been between the ages of thirty and forty. There are very few over and very few under that age; that is, of the pulmonary bronchogenic type. Most of the patients we have seen have come in because of dyspnea. Watching these people over a period of several years, we believe that from the time of the first diagnosis to the time of death they will live about six months. That is, from the time of the first dyspnea until the case has run its course.

The upper lobe seems to be more frequently involved than the lower. I cannot account for that and it confuses the differential diagnosis with tuberculosis. Many of these cases have been diagnosed as asthma or have been diagnosed as abscess. I do not know what you other men's experience has been, but that is ours.

I do not believe that x-ray is always characteristic, but I do think that two x-rays taken about six weeks apart will usually make a diagnosis.

As to treatment with x-ray. Surgery does not seem to do any good while x-ray does seem to help for about the first month, probably due to the fact that it relieves the bronchial spasm. You may get fooled on this because you will get apparently a recession with a good result but about a month later you will find the case will pick up and go on in spite of everything.

I appreciate Dr. Newcomb's paper very much and think he has covered the ground very thoroughly.

Dr. Benjamin Goldberg, Chicago: I would like to say a few words about the early diagnosis of bronchogenic carcinoma. Most of the case reports concerning patients with this condition, including those in which an early diagnosis is supposed to have been made, evidence lesions which are very extensive, very frequently with metastasis and quite often only recognized within a few months of a termination of the patient's life. In chest diagnosis we have stressed the importance of a definite sequential development of symptoms and signs in this condition, which enable an early diagnosis to be made. The patient is usually above the age of thirty-five and comes complaining of an irritative cough which continues and is not relieved by any of the cough sedatives prescribed. Sputum of a mucoid type is usually extruded and blood is found in such sputum intermittently. Occasionally carcinoma cells may be found. Roentgen films made at this time are negative as to any definite changes suggestive of malignancy in or about the bronchi, inasmuch as these early lesions do not stand out on the film. If the carcinomatous nodule tends to grow into the lumen of the bronchus, it reaches a point where it may just fill that lumen. During inspiration at this time, with a relaxation of the bronchial wall, air may pass this point, but during expiration, with bronchial contraction, the bronchus loses even its slight patency and the alveolar area supplied by this bronchus becomes distended or emphysematous. At this time we find on physical examination over this area tympanitic resonance with suppressed breath sounds. Bronchoscopy, carefully performed, will then evidence the lesion. When complete obstruction has occurred, atelectasis immediately follows and the diagnosis at this time should be a simple affair. Pneumography, practiced with lipiodol, will also show a definite obstruction at this time.

Dr. W. H. Newcomb, Jacksonville (in closing): A number of cases of bronchogenic carcinoma have been operated on for brain tumor when the primary growth was in the bronchus itself. It is a good plan to suspect a bronchogenic carcinoma when you are dealing with a brain tumor, particularly of unknown origin. I remember one case I had not long ago who went to operation for brain tumor. At operation a secondary carcinoma was found. There was one thing we did not do in that case and that was x-ray the chest. We could not locate the primary growth.

COOPERATION BETWEEN THE DEPARTMENTS OF PUBLIC HEALTH AND THE PRACTICING PHYSICIANS*

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To attain the highest efficiency in the conservation of health and life there should be complete cooperation between the departments of public health, the practicing physicians, and the laity in general. With thorough cooperation between the departments of public health and the practicing family physicians it is always possible to secure the approval and cooperation of the public, for almost any reasonable worth-while health project.

Cooperation between practicing physician and health department is necessary to success in any public health endeavor. That principle is basic. All official relations between the two must therefore keep that end in view.

The function of the health department is to make the public dissatisfied with prevailing health conditions in every respect where improvement is economically possible. It is the function of the practicing physician to provide and supply the medical service necessary to bring about the desired improvement. This eliminates the health officer and the health worker from the practice of medicine. It places upon the medical profession a large responsibility in preventive work.

To make people discontent with present health conditions, the health officer must know with great accuracy what prevailing conditions are and must be able to demonstrate to the community leaders that improvement is possible, desirable, practicable and economical. This brings up first the matter of reports and second, the methods of demonstration.

The collection of information is a primary requirement to successful health service. The practicing physician is the only reliable and practicable source from which to obtain most of the essential information. Routine relations between health departments and private practitioners therefore begin with reports. To develop a cooperative attitude and obtain the desired data, health officers should cultivate in doctors the habit of prompt, complete and satisfactory reports. This can be done by frequent personal contact at stated meetings and elsewhere. Legal process to compel physicians to report should be resorted to only in cases where the justice of such action would be unquestionable to the profession and public alike. Contact with physicians should be made frequently by the health officer also through written and printed communications, in order that doctors may know that the information collected is utilized and appreciated. The appointment of an active public health committee from the membership of the county medical society would be the means of greatly facilitating the development of happy relations between health departments and practicing physicians. It would be the job of the health officer to keep the committee busy. Something to this effect prevails on a state basis in Illinois, where the advisors of the Director of Public Health usually embrace representative physicians who stand high in the counsel of the State Medical Society.

That the matter of case reports can be improved is illustrated by the results of a statewide morbidity survey made two years ago, in Illinois. In this test project, which covered one per cent of the population in a house-to-house canvass, only 30 per cent of the test cases of infantile paralysis had been reported. Only 66.66% of the cases of small pox were reported two years ago. If these findings are representative we are getting only two-thirds of the cases reported at best. Various comparative studies indicate that reporting in Illinois is fully as complete as that in most other states. The health officer, therefore, in his relation to the medical profession can afford to spend a good deal of time in promoting registration of cases.

Armed with statistical and other evidence which shows the existence of reducible sickness and death rates, the health officer should go first to the organized medical profession with his facts and his program. His business is to make doctors feel that upon them devolves a very definite and large responsibility in protecting the public from preventable illness.

Doctors are educated and trained at no little expense to society. While a very considerable

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item to the individual student, the amount paid out to medical colleges in fees and tuition is but a fraction of the total cost of producing a physician under modern circumstances. All medical colleges are heavily endowed or draw large funds from public treasuries. In return for the privileges and benefits thus acquired a doctor should be made to appreciate keenly his responsibility to the public, and it is the health officer's duty to see that he does fully understand his obligations to society in this respect. Here again a public health committee from the Medical Society would prove to be a helpful medium through which to work, but a committee can never replace personal contact.

During the past four years, at the invitation of the council of the Illinois State Medical Society, I have attended most of their meetings in the capacity of State director of public health. Here we frankly discussed the public health problems, the problems of the physicians and the projects that would better the health conditions of our State. I also visited county and district Medical Societies and lay groups in practically every part of the State—in approximately four hundred meetings. This lessened misunderstandings and promoted cooperative efforts in reducing the morbidity and mortality in Illinois.

Unless the health officer goes to the physicians with his facts and his program the practitioners are apt to grow tired of reporting. It is time consuming and tedious to make out detailed case reports. When no effort is made to show the practicing physician how the information thus collected is utilized for the benefit of the community in which he lives and for his own edification, he is apt to grow careless and even antagonistic toward greater demands from the health department.

Promoting discontent among the public, on the other hand, has a profound influence over the relations between health officer and doctor. The health officer, for example, persuades a mother that her baby, at the age of six months or one year, should be protected against diphtheria with toxoid. There should be no cause of uneasiness about what attitude the practicing physician will take when the mother appears before him for further advice and the necessary service. Again, the health officer succeeds in interesting men and women in periodic health examinations. They go to practicing physicians in good faith. If the opportunity thus created for doing the patients a real service is neglected, then nothing calculated to reduce friction and add harmony to the relation between health department and private physician has been contributed. When the health officer sends a school child to a physician for the correction of defects he should enjoy a confidence that the private doctor will accept the situation as a real opportunity, rather than dismiss the patient with an air of triviality.

These suggestions emphasize the importance of an understanding between the health department and the practitioner which is sympathetic and cooperative. To bring such relations to pass the health officer needs to spend considerable time in cultivating a cooperative attitude in the medical profession. In a good many communities, and even states, this matter has been neglected, apparently on the grounds that doctors, as such, are conversant with public health problems and await only the injunction of health officers to embark without questions upon programs offered as a remedy.

Only a short while ago, as State health officer, I brought to the attention of a county medical society in Illinois, the fact that diphtheria consistently, from year to year, caused a higher death rate in that county than in any other county in the State. The same county experienced a mortality rate from typhoid fever and an infant death rate far in excess of the State average and of neighboring counties. The doctors of that county medical society were amazed to learn of these conditions. Their attitude has been changed from one of complacent contentment with local conditions to that of active interest in proposals calculated to relieve the situation. They feel also that the health department has performed an important service to the medical profession and to the public in presenting the information and in suggesting a program to remedy matters. No physician and no medical society relishes the reputation of practicing in an area which has a health record worse than any other comparable area.

It is probable that relatively few doctors know what the infant or maternal death rate

in their community is, and how this rate compares with those of similar places elsewhere. Very few physicians know whether typhoid fever, tuberculosis or diphtheria is excessive in their localities. It would seem to be sound practice, therefore, for the health department to conduct surveys rather frequently and keep physicians well informed on all current health conditions and problems. The end in view would be, of course, to make every physician feel that he is in reality a public health officer.

Dr. Shirley Wynne, of New York, has expressed this idea very well. In speaking of diphtheria prevention he said:

"*The doctors must do the actual work of immunization.* There is a changed conception of the function of the practicing physician.

"For years he has been called a private physician. A physician is primarily a public health officer. Every case of diphtheria is a *public* matter."

Dr. Wynne might well have added that every case of smallpox, typhoid fever, scarlet fever, tuberculosis or any other communicable disease is a public matter. Furthermore, no physician fulfills his obligation to society unless he regards each case of these diseases as a public matter by reporting it promptly to the health authorities and by taking such other precautions as are necessary to prevent spreading. The report of a case of contagion is to health worker what an alarm is to fire fighting organizations.

I believe that making the practicing physician conscious of his duties as a public health officer in his community, pointing out to him health conditions that could be improved, and impending epidemics that could be prevented, are some of the major factors in the cooperation between health departments and practicing physicians where good may be accomplished.

Last summer two cases of typhoid fever were reported in a city of 1700 population in Illinois. This city had no safe water supply, no sewerage system and the setting was perfect for an outbreak of two or three hundred cases of typhoid, with perhaps twenty to thirty deaths. But prompt cooperation between the local physicians, the city officials, the school officials, and the Department of Public Health, resulted in the immunization of more than 1,100 of its citizens, and the adoption of measures to limit the cases to the two originally reported.

A number of cases of typhoid fever were reported in Springfield early last summer. They were widely separated and for a while baffled the attending physicians and the health officers as to the source of infection. But when all milk and food handlers were required to submit specimens for laboratory examinations, and a number of typhoid carriers were found in this group, the problem was solved. These prompt measures limited the cases in that city to twenty, instead of probably three or four hundred.

Cooperation between the Department of Public Health and the practicing physicians and their dissemination of knowledge concerning preventive medicine, has made possible the lowest morbidity and mortality rate that has ever been recorded in the history of Illinois. Cooperation of these two groups has also reduced the incidence of sickness and resulting deaths throughout the civilized world. If there could be complete cooperation between the department of health, the physicians and the laity in general, with the knowledge we already have, if properly applied, there is no reason why most of the communicable diseases should not become extinct in all modern civilized nations.

The health department is not in the position of an agency seeking cooperation from physicians without having something to offer in return. It can furnish diagnostic laboratory service. It has authority to make rules and regulations which affect the doctor's daily life. It commands access to channels of publicity and education which are largely closed to the practicing physicians. It can influence public opinion with an ease which can never be acquired by the practicing physician. It can exercise an influence over legislative matters that directly concern the medical profession, which physicians are not in a position to duplicate. The newspaper, the radio and the motion picture open channels to the public mind which are charged with propaganda of quackery and proprietary drug interests. Health departments, as official governmental agents, are in a better position to combat the evil influence of

such propaganda than is the organized medical profession.

From time to time during the past four years vicious articles have appeared in the public press not in keeping with the truth and scientific facts—ofttimes reflecting on the medical profession. When called to my attention, as director of Public Health, armed with statistical facts and data, I always replied to the articles and mailed copies of my reply to the local medical society, the parent-teacher groups, and others interested. With a single exception, we secured publication of my reply in the same periodical that broadcast the misinformation. We thus rendered a real service to both the medical profession and the public.

Health officers and physicians cannot sidestep nor evade their responsibility for the sanitary and the health conditions of their communities. The morbidity and the mortality of a community or city more or less reflects the skill, energy and influence of the health officer and physicians living in those communities and cities.

The primary duty of a health department is to the public. The primary duty of a practicing physician is to his patient and his clientele. The health officer therefore looks at matters from the standpoint of the community as a unit, while the doctor tends to visualize things from the standpoint of the individual. The relations between health department and practicing physicians are, therefore, very close to ideal, when through the establishment of mutual confidence the health officer is able to make the doctor realize the importance of individual to community health and govern his professional activities accordingly.

DISCUSSION

Dr. W. R. Marshall, Clinton: I have enjoyed Dr. Hall's paper very much. I am only sorry that the paper was not read before a larger audience of general practitioners. Dr. Hall's recent term at the head of our public health department and his long service in the general practice of medicine, associated with his activities with the inner organization of our State Medical Society, I think, fits him to give us a paper of this kind, and he speaks with an authority that we all should accept. I think that Dr. Hall's statement that every practitioner is a health officer is a very, very true one. In the practice of medicine there is a field for the health department as well as the general practitioner and, as I know the health department since I have been practicing in the State of Illinois there has been a willingness on their part to heartily cooperate with the general practitioners. I know of no exceptions. I know that, during Dr. Hall's administration, we have had a hearty cooperation with the members in our county and with our medical society; and this has also been the case with his predecessors at the head of the department. We have had some experience in the past year in the matter of cooperation in our county. A year ago, with the help of the health department, we immunized between two thousand and twenty-five hundred school children in our county against diphtheria, and later in the fall gave the Schick test. We are having now a little epidemic of typhoid fever in our county and we have had the hearty cooperation of the present health department in tracing the source of this and preventing any additional outbreak of typhoid. Some eighteen or more cases came from a church supper. The health department had two men on the job immediately and traced the source of the infection and gave a very hearty co-operation to our county society and to the general practitioners in our community. So we have a warm place in our hearts for the health department.

As Dr. Hall says, the health department has something to give to the general practitioner, when they ask for cooperation. With their laboratory work, and their helping with preventive medicine and all of the organization work, it is, I think, more than a 50-50 proposition with the health department and the general practitioner. It is only by cooperation that we get the fullest benefit in health work. You see this illustrated sometimes in cartoons where two mules are tied together and there are two boxes of feed and each one is trying to get to his feed. They are tied so that they can't and they finally get together and both of them go over and help themselves with one box of the feed and then go to the other. If the general practitioner and the health department work in that way, there is nothing but good that can come from it. And in this day and age of women's clubs and parent-teacher organizations and chambers of commerce and lodges, and this, that and the other, with the cults entering into the practice of medicine, it behooves the general practitioner and the health department to cooperate in order to maintain the standard that they should.

I, perhaps, do not know very much about this great bugaboo of State medicine that we hear so much about. I personally do not have any fear of State medicine in our State when things are going as they are. I think in every case, if the head of our health department is not practically selected by our State medical organization, he has the O.K. of the inner activities of the organization before he is appointed to the health department.

I just want to say again that I heartily agree with everything that Dr. Hall has said, and I regret that more general practitioners could not have heard his paper. I thank you.

(Dr. Hall did not close the discussion.)

Lecturer: "I say, my good man, you can't sleep in here!"

Bored Individual: "I could if this guy next to me wouldn't snore so loud!"

MEDICO-LEGAL ASPECTS OF "SPONTANEOUS FRACTURES"*

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In the case of *Newton* v. *Industrial Accident Commission of California et al.* (Cal.) 267 Pac. 542, plaintiff, a minor of twenty years, was in the employ as a general roustabout of one Brown, a highway contractor, and had been in such employment for some months. On or about October 6, while working on a public highway, he was sent by his employer to a point about one mile distant to get a truck. He went to a point of the highway where he knew the truck would pass, and waited for it. As he was waiting the truck came along, but at about the same instance of time another automobile passed between the truck and the boy, so, being afraid as the boy testified, that the truck driver did not see him, he hallooed to the truck driver, and ran down the highway after the truck. The truck slowed down, and as the boy was running along the dirt portion of the highway, he heard or felt his knee snap. He did not fall, although he felt his knee crumple under him. He recovered without falling, and continued to the truck, and rode on the truck for about one hour. His knee started to ache and to swell, and his employer sent him to Doctor Harris. Hospitalization and treatment thereafter followed. On December 19 of the same year a refracture occurred when the boy stepped into a hole or depression while walking. The testimony showed that the boy did not stumble, trip over anything, or step into any depression while running after the truck. The expert testimony of the attending physician and surgeon, Doctor Harris, during the trial for recovery of an award in favor of the boy for the first and second injury was as follows: "From the man's history and from the fact that there was no bruise, excoriation or contusion at or about the knee-joint, I would be led to believe that the fracture of the patella was caused spontaneously while the boy was running to catch the truck. I do not believe that there was any extraordinary strain or trauma or exaggerated movement, but that the fracture occurred as the result of the normal motion of the leg in running. The recurrence, in my opinion, was not caused by an extraordinary movement, but simply by a misstep. Operative findings at the second setting showed the fracture to have recurred through the previous fracture lines. I do not believe that there was any period of partial disability following either fracture."

Upon these facts the commission found that the evidence did not establish that the fracture was caused by injury or strain arising out of or occurring in the course of employment. Compensation was denied. A petition for a rehearing having been denied application was made to the District Courts of Appeals for a writ of *certiorari* which also was denied. The case was carried to the Supreme Court.

Was the medical expert correct in his testimony as seen from the standpoint of a bone surgeon? Was it "spontaneous fracture"?

Before the writers will go into the details of the topic they wish to call the reader's attention to the fact that the term "spontaneous fracture" is misleading. This word carries with it the conception of happening unenforcedly, originating in itself, without external cause, while in truth in every "spontaneous fracture" there are two component parts: a demonstrable underlying abnormal condition of the body, or of the bone itself, and some external causative agent which, if considered as a traumatic force, would be insufficient to fracture a bone of normal structure and resistance independently of the first mentioned condition of abnormality which weakens the bone and its structures. It would be better and more intelligible to call such a fracture: A false fracture, a pseudo-fracture, a pathologic fracture in contradistinction to the true traumatic fracture. We shall, therefore, define a "spontaneous fracture" as a pathologic, pseudo, or false fracture which occurs on account of abnormal fragility of the bone tissue by virtue of a pre-existing disease, or diseases, and which causes the bone to give way under force insufficient to cause damage to a normal bone.

The causes of such enhanced fragility are manifold, and they may be divided roughly into six groups: Three local ones: Tumors, foreign bodies and local infections, and three

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general ones: Infections of a general character (such as blood poisoning, pneumonia, typhoid fever), certain systemic disorders and heredity.

For the claim adjuster, not being a physician, this division is not of much value, and we shall, therefore, disregard it and classify the fractures according to the possibility of occurrence in medico-legal cases.

In workmen's compensation cases and similar cases of master and servant pseudo-fractures happen less infrequently than the reader may suppose. Tuberculosis, syphilis and any kind of injury with subsequent infection which exists over a comparatively long period of time are frequent underlying causes. The infections are mostly of the insidious type. Imperceptibly the bone substance proper and the bone-marrow become infected and eaten up by the infection within the bone cavity. There is originally a slight accident, such as a small cut, a stab into the flesh, or some other form of industrial injury. Some months later the person so afflicted with the bone disease shows signs of abnormal fragility of the bones. Chronic osteomyelitis, an inflammation of the bone-marrow is a good example for this type of cases. The clues are few and far between. The course being insidious, there takes place a gradual change of the bone tissue resulting in what is called rarefaction of the bone substance which means that the previously normal bone substance becomes less and less dense until, finally, it may be covered with a thin sheet of bony substance. The length of time which intervened between the original accident and the final outcome of the infection, the slight importance given to the original injury by the patient, or even the doctor who treated him for his injury, and the apparently obvious lack of causal connection may induce the employer to resist claims which are absolutely justified and compensable. On the other hand, damages may be awarded to an employee for consequences of an injury which he had suffered while in some other employment, and under some other, different master who in fact should be held responsible for the damages. The claim adjuster should always investigate the possibility of the above-mentioned diseases such as osteomyelitis, syphilis or tuberculosis as a safeguard against unwarranted claims of employees. There may be other bone areas infected in the same manner, and of the same or a similar character, but not yet noticeable to the naked eye. X-ray pictures should be taken of the several parts of the claimant's skeleton in order to discover a pathologic fracture. Insurance companies, employer-corporations and others interested in settling claims of such a nature should not avoid these procedures and costs because of the seemingly improbability or impossibility of the existence of such a condition as multiple bone infections.

While infectious diseases of the chronic type are usually the cause of pseudo-fractures, there are other occasions in which the claim adjuster should look out for unfounded claims. Thus local pressure may cause a thinning of the bone substance at a place where such pressure is constantly exerted. It stands to reason that a certain amount of time is necessary to produce a condition of the bone favorable for pathological fractures in such cases. So it may happen that years after foreign bodies such as metallic nails, spikes, screws or clamps have been fastened to a previously broken bone in order to fix directly the fragments and to keep them in place until the bony ends unite (as in case of compound fractures of the limb), the surrounding healthy tissue is acted upon by the constant pressure of such metallic bands or rings causing atrophy of the bone tissue and diminishing the strength of such bone tissue. It is not the old fracture line which finally breaks, but the tissue underlying the mechanical aid of consolidation of such fractured bone ends. The claim adjuster should always investigate as to the possibility of previous operations of the described kind, and in case of doubt should have an expert make a thorough examination along these lines, too.

Less capable of detecting the possibilities of pseudo-fractures is the claim adjuster in cases in which there are tumors which affect the bone. Such tumors seem to form at the seat of previous injuries and of chronic irritations. Tumors may be benign or malignant. To the former belong the so-called cysts which may occur in the bone either singly or in groups. A cyst is a sac or cavity filled with a fluid or semi-fluid. While these cysts occur mostly in the maxillary bone (upper jaw) in connection with teeth, they may be found everywhere in the tissues of the human body. In the bone

they begin in its interior and as they increase in size, they expand until they may be covered only by a fine layer of bone substance. So-called dermoid cysts may be found in the bones of the skull, often rarefying the same to a large extent. To go into the details of the different types of these and other tumors would lead too far and cannot be done in this paper. However, one type of tumors, other than cysts, shall be mentioned in this connection, because of their potential value as a clue to the claim adjuster in his medico-legal investigations: Cancer and similar new growths. Where the cancerous growth has affected directly the bone, the solution of the question whether or not there is a pathologic fracture may be, or may not be, a comparatively simple task. But there are cases in which the cancer has imperceptibly spread and has sent offshoots through the blood stream or through the lymphatics to other organs, particularly to the spine, forming so-called metastases. These secondary implantations may occur in any bone in which they corrode the bone substance, and finally lead to a pathologic fracture. The investigator should, therefore, be on the alert and should inquire about previous operations on the womb, stomach, intestine, rectum or other organs. The reasons for such operations, if any, should be investigated, and if the investigator finds a history pointing to early cancer which was operated on, x-ray pictures should be taken of the spine and of other bones.

However, the claim adjuster should not lose sight of the fact that none of these conditions mentioned exclude categorically a claim for compensation due to industrial accident because a pre-existing disability does not render the employer immune against compensatory awards by the industrial accident commissions. The most that can be hoped in some of such cases is to cut the compensation down to the amount to which the injured employee is justly entitled under the compensation act.

The next class of cases which may be connected with a pseudo-fracture or many of such fractures are such as create the suspicion of malpractice, assaults and batteries and other torts. These fractures may become a matter of concern in civil as well as in criminal cases. We have already mentioned the pressure which may be exerted by foreign bodies upon healthy bone tissue leading finally to a pathologic fracture. An impacted tooth may act in the same manner, causing first inflammation and subsequently atrophy of the jawbone. An attempt of the dentist to extract such a tooth may result in a fracture of the jawbone, a suit for malpractice against the operator may ensue, even though all the ordinary skill and prudence has been used by the dentist which other dentists in similar communities, under like or similar circumstances are using. Another case is that in which certain hereditary conditions are the underlying factors of a pseudo-fracture. The writers wish to mention in this connection an abnormality called osteogenesis imperfecta. It is found in infants and young children. Multiple fractures of the ribs and of the long bones may occur. Niklas, as cited in McCallum's "A Textbook on Pathology," p. 859, Saunders and Co., 1916, describes a case of a stillborn infant in whom more than sixty fractures were found, most of them produced some time before birth. One imagines how easily a case of infanticide or of malpractice could be made out against any person or the attending obstetrician. One thinks of it—sixty fractures —and a layman would condemn the attendant as a cruel, barbarous and unskilled doctor. X-ray pictures will disclose the reason for these fracures. The diagnosis, if not made at birth, and provided the child survives, will reveal itself later on in early childhood by an unexpected fracture from the most trivial injury. What has been said about the obstetrician may apply very well to attendants in children's hospitals, foundling homes, orphan asylums and other institutions in which infants and young children are taken care of. For the sake of completeness there may be further mentioned a disease, called marble bones, and another one, Gaucher's disease. The diseases require medical experts. The latter disease may run in the same family affecting several children, and there is a possibility that other members have suffered similar fractures.

In hospitals for mental and nervous diseases there may occur cases of pseudo-fractures due to nervous disorders. It stands to reason that such cases may be under care in a private home, too. These fractures may become a cause of action against nurses, orderlies and even pri-

vate persons who have no connection with the medical profession at all. Once in a while a claim is made against such hospitals that the patients, who are usually seriously sick, have been mistreated. Slight movements of the patients while in bed, under close surveillance, may cause such pathologic fractures. Among the causing agents of such nervous diseases, leading to pseudo fractures, must be mentioned the fact that the nervous tracts of the brain and spinal cord are interrupted by pathologic processes which cause loss of sense of muscular balance and of pressure. The innervation or the nerves regulating the nutrition of the bones are also impaired, and in consequence of these and other factors, the bone, or bones, become undernourished, pressure is exerted upon them which pressure is not counteracted by change of position, and finally atrophy results with ensuing possible pseudo-fracture. Tabes dorsalis, general paralysis, late syphilitic processes, are most important in this connection. Often the investigator will have a lead from the mere fact that the patient is confined in such a hospital or under a similar private care, that there is a wasting disease, a disuse or nonuse of the limb involved, and an under-development of the respective part of the body or other things.

In homes for the aged the attending physicians and nurses, or other persons, may be exposed to unjustified accusations on account of similar conditions. Old persons show an increased fragility of the bones, and this is particularly evident when such old persons have been in bed for a long time, and when the limbs or bones have been subjected to long immobilization. The question whether there is a true traumatic fracture or a false fracture may in such cases become the subject of heated arguments among medical experts, jurymen or others, when they have to decide such a question for themselves.

The writers wish to call the attention of the reader further to a certain disease called osteomalacia. It does not consist, like rickets, in the disturbance of the development of the skeleton, the growing bones not being retarded in their normal course of ossification. The skeleton has already undergone normal development and has acquired normal firmness. The bones become soft and friable afterward. The female sex is noticeably predisposed to this disease. It is a disease of the adult. Among exciting causes child-bearing is certainly the most important for both: the first signs of osteomalacia and for the fresh exacerbations which usually date from the time of pregnacy. The earthy salts of the bones disappear, beginning to do so in the interior, spreading outwards and causing a corresponding softening of the bones. The general condition of the patient is often unimpaired for a long while except for some pain and impairment of motions. There is an ill-defined, deep-seated pain in the lowest part of the spine, the nape of the neck, the back and the thighs. The disease runs a chronic course, occupying seldom less than two years and oftentimes even five and ten years. There is also an endemic form of this disease. In any case of auto accidents, industrial injuries or other personal injuries of women the investigator should suspect this disease when he thinks that there is a pathologic fracture rather than a true trauma. He should inquire into the past history of child-bearing; that claimant is a woman of middle age may be taken into consideration, and if she has had the above-described pains the suspicion is strengthened so much more. X-ray pictures of the bones will prove of much value in the diagnosis of this disease, and under circumstances the fact that the ailment responded to proper treatment may give a lead.

Finally, there are some other diseases which may be the cause of pathologic fractures, and which must be mentioned: scurvy and certain diseases due to faulty metabolism. They are, however, particularly within the province of the medical man, since even the most careful general investigation may not uncover any trace of the existence of these ailments.

It is quite significant that the decision of the Supreme Court of California, to which we are going to come back now, is, so to say, prefaced by the following words of the chief justice: "On further consideration, we are of the view that, notwithstanding the rather persuasive arguments of the petitioner, the decision of the District Court of Appeals, affirming the action of the respondent commission denying an award should stand. Although we might disagree with the commission as to the weight of the evidence before it, as an appellate tribunal

we may not overturn a finding of fact, if there is some evidence to support it."

The reader who has been following our explanations up to the present time will probably now be interested in an interpretation of the fact of the case of *Newton* v. *Industrial Accident Commission of California et al.* (Cal.) 267 Pac. 542, which will show why the judges of the Supreme Court might have been inclined to disagree with the commission in its findings.

A knowledge of the anatomical relations of the kneecap and surrounding other structures is necessary to a perfect understanding of the fractures to which the kneecap is liable.

The patella is a flat and triangularly egg-shaped bone of about the size of a silver dollar. Attached to the kneecap upon its upper border is the tendon of a group of powerful muscles of the thigh, the great extensors of the leg. Upon each side of this comparatively small bone are attached two more strong, but not quite so powerful, muscles. Below these insertions of the above-described muscles there is another attachment, a broad band of tissue which is the union of wide, dense sheaths of the muscles of the thigh, and which is called the great fascia. It is inserted on the lower border of the kneecap.

Thus we see that a comparatively very strong pull is exerted upon the kneecap constantly which acts as a fixed point on which a lever moves. If the pull becomes excessive for some reason, the fulcrum is bound to break. This is the reason why we have in fact three types of breaks of bones: the true traumatic fracture caused by some external violence, the pseudo-fracture which the reader is now sufficiently familiar with, and fractures caused by violent muscular contractions. Although fractures of the normal bone from muscular contractions are comparatively very rare as compared with fractures from external violence, nevertheless they happen. We must consider as true fractures thus produced only those cases in which other intrinsic or external causes can be excluded as the essential vulnerating force. In this group of fractures belong those of bony prominences that serve as points of insertion of powerful muscles such as the lower jaw-bones, the shoulderblades, the arm, the thigh and the rear part of the foot. The fracture of the patella embraces about one-third of these fractures caused by muscular contractions. The fractures occur from violent contraction of the above-mentioned group of extensor muscles of the leg in persons who make any extraordinary effort to retain the erect position when threatened by a fall, or muscular contraction takes place when the knee is flexed, in which case the fracture occurs in consequence of bending and traction at the same time. Three things, however, stand out conspicuously: a, That there is no underlying pathology as in pathologic fracture; b, that there is no sign of external violence such as excoriations, bruises, or contusions, as in the case of a true traumatic fracture due to external force; and c, that these excessive muscular movements which are of a highly complicated kind anyway, and which cause the fracture, occur when the individual's attention has been drawn away from the voluntary action of the muscles, the powerful pull of which causes the bone to become fractured. In other words, under the stress of the moment the individual controls his muscles in a subconscious or instinctive manner, quick, and upon the spur of the moment, while his mind is directed to some other portion of the actual happenings. Therefore, he is not able to give more than a relatively very inaccurate statement of what has happened to him. This accounts for the paucity of the medical history of such cases as ours. However, the history does not show any infection, general or local, nor any hereditary condition, nor any constitutional shortcoming to account for the existence of a pseudo-fracture. The condition precedent to the diagnosis "spontaneous fracture," a definite pathologic underlying cause is absent. So, it may be asked how it may be assumed that there is a false fracture in this young man of twenty years of age.

Neither does the fact that there were no excoriations, bruises, or contusions, standing alone, prove that the fracture must necessarily be a pathologic one. This fact is at best equivocal, but would be of greatest value if really a general or local pathology had been found. It would have been a valuable, additional, affirmative proof of the existence of a pseudo-fracture. As things stand, however, the absence of external signs of violence is equally

compatible with internal trauma caused by excessive pull of the powerful extensor muscles of the thigh. Equally unsatisfactory is the conclusion that the first fracture must have been a false fracture because the refracture occurred through the old fracture lines. The fact that the refracture happened to be just through the old fracture lines seems to prove no more than that there has been not yet a sufficient union of the fragments and in view of the history of the case that no more than eight weeks have elapsed between the first fracture and the refracture, it is more probable that the union was not sufficiently firm to warrant the running around of the boy such a short time after his discharge from the hospital.

If we take all the facts together: The absence of signs of external violence, the fact that the boy has not fallen, although he was liable to do so, that a refracture occurred through the old fracture lines and that no pathology could be found to account for the first fracture, we come to the conclusion that this complex of facts is equally, if no more, compatible with the theory of a true traumatic fracture caused by violent muscle pull, and that the theory of pathologic fracture is lacking of one important detail: the local or general pathology causing a pseudo-fracture.

How does it happen then that the Industrial Accident Commission found that the plaintiff was not entitled to an award in his favor, and how did it happen that the appellate courts were bound to uphold this decision? Industrial accident commissions are fact-finding bodies. Therefore, if there is sufficient evidence supporting such findings of the commission, the appellate courts are bound thereby and cannot on review draw their own inferences from the testimony set forth in the record. They cannot, in presence of sufficient evidence to uphold the decision of the commission, conclude from the testimony whether or not the petitioner is entitled to compensation. Their jurisdiction extends only to the ascertainment of the fact that there is, or that there is not, testimony supporting the findings.

Further, the commission may not disregard medical expert testimony of the subject under consideration, if it is one within the knowledge of experts only, and if it is not also one within the knowledge of laymen. Under such circumstances expert testimony is conclusive, even though contradicted by non-expert witnesses (240 Pac. 58). Then, again, the burden of proof that the accident arose out of the employment and during the employment is upon the petitioner, while the burden of proof that the injury culminated solely by reason of a pre-existing, inherent defect is upon defendant. In order to prove his case, the petitioner must make some showing, some *prima facie* case; he must give some evidence tending to prove that injury arose out of the employment and during the employment. If, as in our case, the petitioner does not prove an outside cause, some external violence connected with the nature of the employment and during the employment such as a fall or a blow, or if he does not prove some extraordinary movement or action such as a violent pull of the muscles, a sufficiently awkward position of the body due to his employment, to account for some extraordinary movement or muscular action, he has not proved his case. The evidence in our case has not come up to the requirements of the commission.

The doctor concluded that there was an inherent defect because of the lack of the above requisites. Whether his conclusion was right or wrong, the commission adopted his view, and having once done so, the commission as well as the appellate courts were bound by it. It is not necessary that petitioner be free from any inherent defects. If the injury arises out of the employment and by reason thereof and during the employment, the employee is entitled to compensation although the inherent defect contributed to the injury. But there have to be some objective signs connecting injury and employment. In absence of such sufficient proof, no award can be made in favor of the employee. From a purely scientific medical standpoint the writers are not prepared to pronounce this case a "spontaneous fracture" as this term is colloquially used in medicine, because of the absence of any showing of some local or general pathology. Summarizing the medical part of the topic we may say:

1. The proper name for "spontaneous fracture" is pathologic fracture, false fracture, pseudo-fracture.

2. False fractures are always due to either general affections, infections, or hereditary dispositions, or they are due to local infections, tumors or foreign bodies.

3. A pathologic fracture requires a definite pathology as underlying cause in order to justify such a diagnosis.

4. The facts of the case of *Newton* v. *Industrial Accident Commission of California et al.* (Cal.) 267 Pac. 542, are as compatible with a true traumatic fracture caused by violent pull of the muscles of the thigh as with the theory of a pathologic fracture in absence of the showing of some inherent pathology of the bone or the bony system.

5. The absence of excoriations, bruises, or contusions is not proof that the fracture has not occurred on account of violent means.

6. A refracture occurring during the yet incomplete process of healing should not be called a pseudo-fracture, and should be regarded as the interruption of the normal process of rehabilitation of the respective bone.

7. From the fact that a refracture occurs through a previous fracture line, no conclusion can be drawn exclusively that such fracture and refracture are due to "spontaneity."

8. The syndrome of lack of signs of external violence, of absence of a fall, and of visible extraordinary motions, or any other happening of such character, does not conclusively prove that the fracture or refracture is pathologic as such term is used in medicine.

9. The medico-legal aspects of pathologic fractures are not properly recognized by attorneys, claim adjusters, and physicians and surgeons.

10. Pathologic fractures are more common than one may think.

11. Pathologic fractures may lead to suits for personal damages, erroneously supposed to be due to malpractice, or they may become matters of concern in criminal, other civil, and workmen's compensation cases.

12. X-ray pictures are of paramount value in cases of false fractures.

13. In most cases a properly trained medical man is able to recognize a pathologic fracture.

14. Attorneys, claim adjusters and medical men should go into details of life history of claimants where there is a suspicion of a pathologic fracture.

15. Slight exertion, mild injuries, undernourishment, nervous disease, and other conditions should put the investigator on his guard as to the possibilities of a pathologic fracture.

16. Claim adjusters, attorneys, physicians and surgeons should always keep in mind the possibility of a pseudo-fracture whenever the case seems to be an extraordinary one from the standpoint of causes of such fractures.

APPENDIX

Cases collected by Dr. C. E. Early, industrial surgeon, Los Angeles, Calif.

Case 1.—A driver of a laundry wagon, aged fifty, was driving along his route. The wagon struck a depression in the road, causing the driver to bounce about six inches off the seat. He experienced pain in the back and had continuing disability. When examined a few days later, there was a definite deformity of the back. X-rays showed almost complete collapse of one of the vertebrae. Detailed history of the patient showed the fact that he had lost about thirty pounds in weight over a period of about two months, also that he had a rather persistent cough. His X-ray pictures of the lungs showed an advanced cancer of the lungs. The collapse of the vertebrae was due to destruction of the bone as a result of cancer, and the collapse would have taken place in a short time without the trivial back injury.

Case 2.—Another interesting case was that of a middle aged man who came in stating that while working as a carpenter he had slipped between the joists and injured his hip. He stated that the injury caused but little pain, and that he was able to continue working, but that his hip had gradually become deformed. Examination showed destruction of bone about the hip-joint with considerable deformity. The leg had shortened about two inches. Subsequent examination in this case proved that the man had syphilis with pathologic fracture about the hip. The case was heard before the Industrial Accident Commission, and at the hearing the man demonstrated to the referee that he had always been remarkably agile for a man of his age. He stood upon one leg and put the other one behind his neck. He also did the "splits." All of his joints were remarkably relaxed, a condition occurring at times in certain forms of spinal cord syphilis. Had the bones and joints been normal, the injured man would have been unable to perform the acts which he did in demonstrating his remarkable physical condition. Had his brain been normal he would have probably had more intelligence than to believe that he could perform such acts, unless he had been trained especially throughout a period of years.

Case 3.—A Mexican laborer was employed unloading and piling sacks of cement, each weighing about one hundred pounds. He had carried and stacked nearly one hundred sacks without event and was in the act of placing a sack on the stack which was then about the level of his head when one of his legs gave way, and he fell to the floor. He stated that he had a sensation as though the floor had given way, and he had gone through a hole. Subsequent examination showed a complete fracture through the thigh bone near the hip with the fragments of the bone overriding about four inches. Examination of the blood showed definitely that the injured man had syphilis. The syphilis had involved the brain, spinal cord and certain bones. The fracture was due to syphilis and not to external violence, as the injured man was doing nothing unusual. There was no external violence at the time the bone gave way.

Case 4.—Another somewhat similar case was that of an American, aged fifty-two, who was working for one of the large oil companies. He and a fellow workman were pulling on a large wrench, when the injured man had a sensation of something tearing in one of his knees. He continued working for two days with some discomfort and swelling of the knee. Then, while carrying a piece of timber his knee gave way and he fell. Examination showed the knee markedly enlarged, but relatively free from pain. Movements in every direction were greatly increased, and the knee bowed outward. X-rays showed marked destruction of one of the large

bones of the knee-joint, there being several detached fragments of bone as large as a pigeon's egg. Subsequent examination proved definitely that this man also had syphilis. The marked disintegration of the bone, had the bone been normal, would not have occurred without extreme violence.

All of the above cases are actual occurrences and all are good examples of fractures occurring in bones as the result of diseases with no or very trivial injury.

CARBUNCLE

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Carbuncle occurs rather frequently. Generally speaking it is readily recognized and not regarded as fatal. It does, however, cause death, especially when it is of the malignant type.

Carbuncles are most frequent in the posterior cervical region, back and buttocks. They may occur in other portions of the body—lips and scalp. The infection enters a hair follicle, undermines the integument, filters into the deeper tissues only to find egress through several apertures, back to the free surface. It is characterized by numerous openings through which the resultant pus escapes.

The pathological findings in carbuncle show, first, an invasion of pyogenic microbes (staphylococcus or staphylococcus and streptococcus, as in this case) in the tissues. This infection creates an increased subcutaneous strain or pressure which reaches its peak and completes the picture in approximately ten days. The acute inflammatory process causes an exudation which is hemmed in by unyielding, deep cervical fascia and the dense fibrous tissue under the skin. This compresses and strangles the blood vessels in the region, causing a septic gangrene in the adjacent tissues. The same process extends to contiguous fields resulting in cribriform perforations through which pus and slough exudes exposing an irregularly excavated ulcer with well defined everted edges. The result is: First, septic slough in gangrenous regions; second, layer of pus produced by organisms in both tissues; third, an area of granulations; fourth, inflamed tissues, circumscribing the entire area.

The severity of carbuncle depends, first, upon the general condition of the patient with special reference to diabetes; second, upon the thickness of the skin, either normally or due to fibrous scars from previous attacks (which was a factor in this case), and, third, the character of the infection and the extent of the borders of the superficial portion of the deep cervical fascia which limits its spread. All of these conditions hasten or retard recovery and contribute very definitely to the course and severity of the disease.

The prognosis depends especially upon the spread when in the region of the neck. The danger increases with the extent and type of the infection. A vital factor is the destruction of the lower vertebral portion of the deep cervical fascia which permits the fulminating process to extend vertically and laterally with respect to the spine. This latter condition was present in this case to an extensive and alarming degree.

There will be no attempt to record a review of the literature. It might, however, be pertinent, to quote an accepted definition. According to Dorland, it is "an inflammation of the subcutaneous tissue, terminating in a slough and in suppuration, and accompanied by marked constitutional symptoms. The swelling is at first covered by a tight reddened skin which later becomes thin and perforated by a number of openings discharging pus. This mass finally sloughs away leaving an ulcerated excavation."

The following report of a case, giving only the salient facts, is justified I think, for these reasons: First, the number and severity of attacks; second, its course and recovery; third, the low incidence of recovery in involvements of such a large extent; fourth, the plan of treatment.

CASE

Mr. H. (White) Aged 60 years, salesman. Came to my office on October 14, 1932, complaining of a sore on the back of his neck He stated that his trouble was of ten days' duration and that he had had treatment administered at a Class A Hospital up to the time that he came to see me. He also stated that the surgeon at the hospital had diagnosed his trouble as carbuncle and had operated on him twice—October 9 and 12.

Prior to this time I had treated him for two attacks of carbuncle infection. The last time about nine years ago when he had one on the back of his neck in the region of the fourth cervical vertebra and the other just below the right scapula. The resulting cicatrix from this attack in his neck became an aggravating factor in the care and treatment of this case. My records show that sugar and albumin were absent and that the specific gravity was normal during his last attack.

Physical examination revealed a large, well developed male, 6′ 2″ in height, weight 190 lbs. with entire back of neck covered with a large surgical dressing. He was decidedly toxic in appearance and said he had considerable pain. His temperature was 101, pulse 98 and respiration 24. On examination the urine was negative as to sugar and albumin with a specific gravity of 1020. Cultures of specimens showed mixed streptococcus and staphylococcus infection. Aside from his carbuncle his chief complaint was inability to get sufficient sleep. His appetite was not good and he looked undernourished. He had lost about fourteen pounds. Examination of abdomen was negative and, except for a rather weak pulse, there was no evidence of heart disease.

On removing the dressing a large carbuncle area was disclosed, the center of which appeared to be to the right of the fourth cervical vertebral region, the same location as the last attack. It had been incised with a large crucial incision. Some of the sloughing mass had been removed. The area of involvement was 8" long. It extended from the occipital protuberance to the seventh cervical vertebra and was 7" along the occipital ridge and 3½" at the level of the seventh cervical vertebra. There was a definite line of demarkation at the occipital border. Within the immediate region of the crucial incision there were numerous openings in the tissue from which extensive slough and pus were escaping.

During this visit local applications of Hydrosal were applied and infra-red lamp was focalized over small areas of the field for periods ranging from 15 to 30 minutes. The entire procedure taking about five hours. These exposures were repeated daily, at which time I incised and removed numerous infected fascial bundles and shreds of fibrous tissue which had resisted the sloughing process in the area involved. The application of Hydrosal was alternated with Hydrosal ointment and aluminum acetate during subsequent treatment.

When the sloughing material was removed the entire inferior margin of the superior portion of the deep cervical fascia exposed a general gangrenous condition of the tissues and, upon removing these tissues, the dorsal lumbar fascia extending down to the fourth dorsal vertebra formed a definite infected pocket. This pocket was packed once with iodoform gauze, after which aluminum acetate was freely used. As the sloughing process continued the open spaces containing pus were filled with aluminum acetate as the antiseptic of choice for dressing.

In infections involving such extensive necrosis of soft tissue (as was present in this particular case) aluminum acetate is a much better antiseptic and far more cleanly than any of which I have knowledge. It has a predilection for necrotic tissue, dissolving it readily and keeping the wound sterile, clean and odorless.

The patient was cared for in the usual medical way.

Fig. 1. Appearance of ulceration Nov. 1, 1932, showing extensive erosion and craters with irregular surfaces on edges and eversion in occipital region and regior of the seventh cervical vertebra of flaps composed of external layers of border tissue.

Fig. 2. Taken Nov. 29, 1932 (4 weeks later). Shows marked improvement with edges of ulceration resuming normal appearance and evidence of flaps adhering.

Various tonics of recognized standard makes, containing large quantities of iron, were prescribed and his bowels kept active with mercurial and saline cathartics. Insomnia was the most troublesome factor the first two weeks of treatment. The patient got most of his sleep while in my office lying upon a couch during exposure to an infra-red lamp. These exposures required from five to six hours each day.

In spite of this intensive course of treatment the patient's general condition remained unsatisfactory and he began to show signs of breaking under the strain. His constitutional symptoms and constant complaints of subjective discomfort were very discouraging. The opsonic index and the phagocytic action of the blood were not sufficient, apparently, to localize the infection.

October 26 an intravenous injection of Colmanganese was administered. On his return to my office the following day he reported he had had, for the first time, some sleep at home and remarked that whatever I had given him on the preceding, day had made him feel better.

Figure 1 is a reproduction of a picture taken Nov. 1, 1932. It illustrates the wide distention of the tissues with a crater-like formation. There are evidences of a beginning regeneration of the tissues.

The flap engaged and everted by a pair of forceps at the dependent point of the ulceration could be elevated sufficiently to expose a pocket visible down to the fourth dorsal vertebra. There were large areas of necrotic tissue in different fields of the main ulceration, from which numerous bundles were removed each day. The resultant pockets or cavities were filled with aluminum acetate and dressed. He began showing signs of decided improvement and his constitutional condition became more satisfactory.

November 1 a second injection of Colmanganese was administered. At the end of the third week, because of improvement in the general condition of the patient, the use of the infra-red lamp was discontinued. The treatment from that time on was local, together with intravenous injections, at weekly intervals, of an ampule of Colmanganese, a colloidal preparation. In all six injections were given.

Figures 1 to 4 belong to a series of 12 pictures taken at intervals of one week, beginning Nov. 1, 1932. They show the ulceration at its worst and the various steps of improvement up to and including the last picture taken March 19, 1933 — four weeks after the patient had been discharged as cured.

Numerous types of dressing were used, but the final dressing of choice was paraffin which was used continuously after December 6, 1932, following which date there was no suggestion of infection. The paraffin was melted in a retort and sprayed rather thickly over the entire area. A pad of cotton of satisfactory thickness was then placed over the wound and held in position by a figure of eight gauze bandage. The dressing was

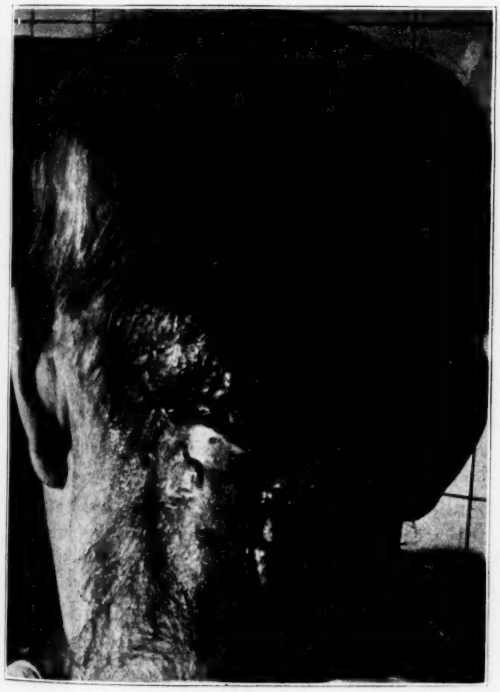

Fig. 3. Jan. 22, 1933. The last picture taken before the patient was discharged. Note improvement and smoothness of the border line; the rapid growth of hair and the normal appearance of the entire field.

Fig. 4. Picture taken March 19, 1933. Four weeks after patient was discharged.

changed daily. This type of dressing proved to be ideal. No skin grafting was necessary. The scar, at this writing, is scarcely noticeable and the head and neck movements are normal.

CONCLUSIONS

1. Carbuncle irrespective of extent of involvement should not become fatal.

2. Pulverized aluminum acetate is the antiseptic of choice. It should be freely used.

3. Colmanganese has a wide range of usefulness; it is non-toxic in therapeutic doses and is a good hematonic.

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THE DAWN OF A SPECIALTY IN MEDICINE ALLERGY AND PHYSICAL ALLERGY

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I wish to express my sincere appreciation to this association for an invitation to read a paper on my favorite subject in internal medicine, this is, "Allergy."

We are passing into a new era in the practice of medicine in the development of this subject. We are making a wide departure from trodden paths. Possibly as wide a departure as that which followed the advent of the early studies in bacteriology. In text books of the present day on general and special pathology, and in the text books devoted to general medicine and the treatment of disease of special organs, we find classifications of disease which consist essentially of malformations, traumata, acute and chronic inflammations, intoxications, benign and malignant tumors, etc. We now have to add to the above, an additional item, namely, the allergic diseases which affect the individual as a whole, and also which can affect directly or indirectly, each of the special organs. It is a question with me whether or not any active living tissue is immune to the effect of allergy.

Allergy differs from the above mentioned illnesses in that it is caused in general by agents which are more or less inert, or actually beneficial or necessary to normal individuals, such agents for example as food, pollen, hair, or insect scales, or by physical agents as essential to health as light, heat and cold.

There are apparently two phases of allergy. The one, a local effect which occurs as a result of direct contact between a sensitive tissue and an offending agent; the other an effect which resembles that which occurs as a result of over stimulation of one or several or possibly all the branches of the vagus nervous mechanism. These effects are of course multitudinous, since the vagus nerve influences the activity of every living tissue.

The local lesion of allergy consists characteristically of pale swelling which is oedematous and anemic, and is surrounded frequently by an area of hyperemia. It can appear with great rapidity and disappear with equal rapidity. Following rapid disappearance there is almost always complete restitution of the parts affected. This is of course subject to gross exception. For example, the allergy lesion can be so intense (exemplified by the Arthus phenomenon) as to cause gangrene of the parts affected. Furthermore, if an allergy lesion affects a part perennially without remission, it can cause hyperplasia of the tissue elements. For example, perennial allergy in the nose gives rise to so-called hyperplastic rhinitis and polyps. In the skin, gross hyperplasia of the skin elements which causes it, in many cases, take on leather-like thickening of the skin; in the bronchii, it can give rise to muscle hypertrophy and prolifheration of the tissues. With complete subsidence of the disease these hyperplastic lesions usually disappear and leave the tissues with complete or almost complete restitution to normal structure.

The above statements are all subject to gross exception, because of the fact that the damage done by allergy depends in large degree upon the situation of the lesion. A gross swelling of the loose elastic tissues in the axilla for example, does no harm. A similar lesion of allergy however, in the internal ear or inside the skull, can seriously damage the affected structures and neighboring structures. Edema in soft elastic parts is not especially dense. In more resistant structures, however, the swelling may be so dense as to give the impression of cartilage.

The allergy lesion can be very gross indeed; in fact, so gross that in cases where the face is involved, the features may be almost obliterated. It can cause obstruction in the trachea, obstruction of the intestines, and, in the uri-

nary tract, can cause such a disturbance that the resulting symptoms may simulate and exceed those caused by stone.

There is a gross pharmacological difference, between allergy and the lesions it may stimulate. The one can be stopped immediately as a rule, by the adequate and ideal use of adrenalin, and may be little affected by morphine. In the case of organic diseases, the reverse status usually obtains.

The allergy lesion also differs cytologically from other diseases, in fact, it is characterized by the presence of a typical cell, namely the "eosinophil." Eosinophils present an almost constant finding in allergic tissues at certain phases of the reaction. They are likely to occur in great numbers. They are to be found not only in the affected tissues but also in the blood during certain times and may amount to as much as or more than 25 per cent of the white cells. High counts such as these however, are the exception, not the rule. Eosinophils are increased as a rule not only in the blood but also in the secretions, such as the salivary secretion, nasal secretion, and bronchial secretions—and even in the mucous secretions found in the stools in the case of allergic diarrhea. The finding of eosinophils is more important from a diagnostic standpoint.

For example, in the case of acute coryza, the finding of a gross preponderance of eosinophils in the secretions indicates that the coryza is primarily allergic. If a gross preponderance of neutrophils is found, the disease is infectious in origin. If there is a goodly number of both eosinophils and neutrophils, the lesion is probably infection superimposed upon a primarily allergic disease.

Whereas the local lesion briefly described as above is grossly important, it is hardly so wide spread or damaging as the wide spread effect of over activity of one or several or all of the branches of the vagus nerve. This effect may be more rapidly fatal in extreme cases than any illness with which I am acquainted. In extreme instances, it may resemble the rapidly fatal histamine poisoning, as observed experimentally in animals. General vaso and capillary dilation may be so extreme that the afflicted individual bleeds to death very quickly in his own vessels. In this case, none of the classical signs of allergy appear. Instead, the patient suddenly becomes apparently lifeless. Pulse and respiration stop, and the patient assumes the appearance of a cadaver. I have had the opportunity upon three occasions of restoring a patient from this condition promptly to a state of health by the quick and adequate use of adrenalin. I have also had patients subject to allergy die suddenly without apparent cause, rhyme or reason, after the eating of a hearty meal. I frankly believe that allergy ranks as one of the most common causes of sudden death of apparently healthy individuals. Death is caused as a rule, I believe, by the encountering of an agent which far exceeds the individual's tolerance.

Allergy may stimulate a great many non-allergic diseases, but almost never stimulates them perfectly, and can almost always be differentiated from non-allergic diseases by careful physicians who understand this subject.

For example: Cerebral allergy can stimulate brain hemorrhage, Mennier's disease of organic origin, migraine, epilepsy or even brain tumor. The distinguishing features lie in family and personal history of allergic diseases, the coexistence of other symptoms typical of allergy. The fact that allergic symptoms are inclined to come and go or migrate, and by the fact that they yield promptly (if uncomplicated) to the effect of adrenalin when ideally administered. Frequently recurring cerebral disease, (diagnosed as a rule as vessel spasm); frequently recurring functional disease of the heart, including tachycardia (not paroxysmal), angina pectoris, and various and sundry arrhythmias, are rather frequently caused by allergic disease, (probably vagal), and can be relieved immediately when this is the case, with adrenalin if ideally given.

There are many types of allergy. There are types which are so widely divergent as to cause pathology and pathogenesis, that we are indeed fortunate in having the non-commital term "alergy" under which we can class the different types of allergic diseases which have nothing more in common than is indicated by the literal meaning of the word "allergy," namely "altered reactibility." Some of the different types of allergy may be grouped as follows:

1. *Serum Sickness:* This can afflict almost any normal individual, if the dose of serum administered is large enough. This

occurs typically several days or two weeks or more after administration of a foreign serum. It may be gruesome in symptomology but rarely is a dangerous illness if controlled by frequently repeated adequate doses of adrenalin.

2. *Accelerated Serum Reactions:* These are likely to occur in members of the atopic family who may or may not have had previous doses of the serum. This illness is likewise gruesome, but is almost always controllable by the use of adrenalin.

3. *Serum Allergy:* This occurs in members of the allergy family who have spontaneously become sensitive to serum. This illness gives rise to violent uncontrollable disease which proves quickly fatal. Coca has frequently mentioned the fact that if a person has tolerated one dose of serum he is almost sure to tolerate a second. Patients with atopic serum sensitiveness practically never tolerate a first dose, even though the initial dose may be excessively small. Lamson reviewed the histories of about 80 cases of reported serum deaths and in approximately half, a history of hay fever or asthma was mentioned. Deaths have been reported immediately following the intravenous injection of one drop of horse serum; several following the use of one c.c. subcutaneously. I knew of one case in which death immediately followed the injection of 1/100 c.c. of horse serum intracutaneously as a test. Some of these deaths might have been prevented in the present day by the use of a tourniquet above the cite of inoculation of the serum, if the serum were injected into an extremity. This method of therapy, given us first by Cooke and several years later, but independently, by Insley, indicates that the arm or leg should be used for the inoculation of serum instead of the generally recommended sites buttock, back or abdomen. In the latter areas the life saving protecting tourniquet cannot be used.

4. *Natural Hereditary Allergy of Atopy:* as it has been termed by Cooke and Coca, represent an illness which is quite different from serum sickness or accelerated reactions and which is apparently the same disease as serum allergy above mentioned. It depends upon a peculiar hereditary constitution through which a person may become sensitive to one or several or many foreign agents. (Cooke and Vanderveer). The illness frequently becomes manifest in infancy, in the form of eczema, gastro-intestinal disease, or in many other ways. In infancy the illness is usually caused by sensitivity to food, and frequently disappears after a few years. The typical manifestations however, often reappear again in late childhood or in youth in the form of excessive sensitiveness to some foreign agent, such as pollen, animal dander, fungi, insect scales, food or sera. Sensitiveness at this age is usually extreme in grade—in fact patients who are so affected may be made ill by amounts of a foreign agent which are so small as to cause the agent to rank in toxity for them far beyond that of any known poison except one such as diphtheria toxin, and tetanus toxin. In this condition the patient can be affected seriously by one-millionth or much less of the offending substance. This type of illness differs from others to be mentioned subsequently by the fact that it can be passively transferred to other individuals by the injection of the patient's serum into the skin of a normal person by the Preuxnitz and Kustner method.

If 1/10 of a c.c. of serum from an egg sensitive case is injected intracutaneously into a normal person, the skin area will react with the formation of a huge hive in case the injected individual eats egg (Walzer). This disease differs grossly from anaphylactic sensitiveness as observed in animals in the fact that the patient cannot be desensitized quickly by sub-lethal dose of the offending agent (Bieredka's Method). This method of desensitization has been tried a number of times in the treatment of human allergy and always with disastrous result. The sensitiveness of a patient of this type however, can be reduced slowly and effectively by repeated and frequently increasing, almost infinitesimal amounts of the agent to which the patient reacts. In this way clinical relief can be obtained, and upon this phenomenon is based our present day methods of so-called "desensitization."

5. The drug allergies are grossly like atopy as above described and may be equally and as tragically extreme, but differ in the fact that sensitiveness to drugs cannot be transferred passively to the skin of normal individuals by the Preuxnitz and Kustner method, nor does desensitization therapy seem practical in this condition.

There are two or more types of drug allergy, one as exemplified by a case of sensitiveness to chlorine, and a case of sensitiveness as described by the writer in which the area of the reaction is confined directly to the point of contact between a tissue and the offending agent. For example: In a case of chlorine sensitiveness the inhalation of chlorine gas causes coryza, cough and asthma and the application of a dilute solution of chlorine to the skin causes a hive directly confined to the point of application. This condition is not transferable passively. The common type of drug allergy, however, is not like the above and is exemplified by the commonly observed aspirin allergy. In this case, symptoms such as hay fever, asthma, hives, or collapse may follow the digestion of a small amount of aspirin. The symptoms appear ordinarily a few minutes or several hours after the taking of aspirin. There may be a little or no reaction at the point of contact of the mouth tissues with aspirin and skin tests are practically always negative. Apparently ten per cent of hay fever and asthma patients are sensitive to aspirin. (Sterm Van Lewen.) I have devised a simple test for aspirin sensitiveness which should always be used before administering aspirin to an allergic patient. It consists of the placing of several tiny granules of aspirin on the tongue of the patient. If he is aspirin sensitive, he usually displays symptoms of allergy within thirty seconds to two minutes. This reaction can be stopped within thirty seconds to one minute by having the patient repeatedly rinse his mouth with a glass of water containing a little dilute acetic acid. The acetic acid prevents the transformation of the insoluble aspirin into the soluble sodium salicylate by the alkaline mouth juices.

In the early days of the study of allergy it was believed that human allergy like animal anaphylaxis could be induced only by protein substances. This of course has been disproven, for humans can become sensitive to such agents as quinine, atropine, morphine and a host of other non-protein substances and even to inorganic substances. Wolf Esner attempted to account for this type of sensitivity by assuming that a non-protein body could combine with normal body proteins so as to produce a new body which could sensitize an individual and thereafter cause a reaction upon adequate contact. This very attractive theory is very difficult to prove in clinical cases, although it can be easily proven in animals by sensitizing to such agents as iodized protein, or protein treated with bromine. In this case the animals may not react to the natural proteins used but may react with symptoms of anaphylaxis if treated with protein altered by bromine or iodine respectively. This possible explanation should be kept in mind by students of allergy. The future may disclose a method of proving or disproving the idea.

6. *Physical Allergy:* In 1932, I made a wide departure from the study of allergy in the discovery that patients could become sensitive not only to material substances, but to physical agents, such as certain rays of light, specific for the individual or to certain degrees of heat generated by mental or physical effort. The fact is that patients could not only become sensitive to physical agents such as those mentioned, but could become so extremely and violently sensitive that a slight rise in skin heat could cause extreme grades of shock in certain individuals excessively sensitive to heat. Likewise, a sip of cold water could cause a violent reaction and shock in patients sensitive to cold. In patients excessively sensitive to light the exposure of a considerable area of skin to sunlight for a few moments could cause hives and shock within a few minutes, which rendered them completely helpless. In this class of patients, that is those sensitive to physical agents, I have observed every phenomenon of allergy that I have observed in patients sensitive to egg, pollen, dander, and other material substances. The fact that the condition exists cannot be doubted and has been verified abundantly in recent literature. Furthermore I have found that such conditions as hives or asthma caused by emotional disturbances and varying types of mental or physical activity are usually in patients who are heat sensitive and react to the heat generated by effort; for example, many women supposedly sensitive to spermatozoa are actually sensitive to the effect of heat and effort. Likewise heat sensitive men who think they are impotent may become virile if they chill themselves with a cold bath prior to the effect of heat.

The mechanism through which patients react to physical agents is rather mysterious and

is probably varied. However, the fact stands proven and verified that reactions in cases sensitive to physical agents is just as specific and real as reactions caused in other sensitive persons by certain types of pollen or epithelium or by certain foods. Light sensitive cases are not sensitive to all rays of light, but only to certain specific rays toward or beyond the violet end of the spectrum. This varies in different individuals. Likewise patients sensitive to cold may not react at all to a skin temperature of 0° C. or at 20° C., but may react violently with rise to temperatures between 5° C. and 15° C. Likewise, in patients sensitive to heat, the reaction may occur very violently to skin temperature from subnormal toward normal or vice versa in cold sensitive cases from a normal or high temperature down toward subnormal. Slight grades of heat which are generated by walking across the room, or even by rising from a sitting to a standing posture, cause in some patients violent reactions which can be immediately stopped by a little cold applied to a small skin area. Patients of this sort are almost always violently affected by the ingestion of hot drinks or foods, or in cold sensitive cases by cold drinks or cold foods.

Heat sensitive cases may be relieved by cold and quiet. They rarely know that they are sensitive to heat, but instinctively lead a quiet life, and avoid situations in which they are likely to be overheated. They often give an impression of laziness. Cold sensitive persons on the other hand may be relieved quickly either by heat or effort. They rarely know of their sensitivity to cold, but instinctively lead a life of excessive activity, are inclined to exercise and develop their muscles and feel relieved after prolonged hot baths. A number of historical characters whose activities typify excessive energy could have been diagnosed as cold sensitive individuals.

In a paper of this scope I cannot deal with the details of these conditions, nor give the proofs upon which my ideas on the subject are based. For this the reader is referred to previous writings.

There are two types of physical allergy. One in which the reaction is confined to the point of contact between a surface such as the skin or the surface membranes of the nose, bronchial tubes or alimentary tract. The other type, or so-called reflex like type, shows reaction not only at the point of contact, but in distant structure as well, and frequently in distant structures only. For example: In a heat sensitive case of the latter type the placing of one forearm in a water bath of 42 degrees centigrade, may cause asthma in one patient, nasal stoppage in another, hives in another or even profound shock, prostration, disappearance of pulse and respiration in another and finally even convulsions, head ache, temporary blindness, vomiting, or any number of symptoms which I could mention. The symptoms resemble exactly those caused by contact with egg in an egg sensitive case. It is interesting to remark that in extreme cases such as the above mentioned reaction can be almost immediately relieved by rubbing a relatively small area of skin with a piece of ice. Often the cooling of a hand, arm or both arms will relieve. One can well wonder why patients of this type are not in a constant state of reaction. The fact is that in patients of this sort, reaction is prevented by a subconscious avoidance of heat and effort or cold which is beyond their tolerance. A change in the habits or situation of patients of this sort may result disastrously; in fact, is likely to result in invalidism, or in heat cases in what is commonly diagnosed, heat prostration or sun stroke.

The causative agent in the two types of physical allergy mentioned are different. In the contact type, the patient belongs to the allergy family, in the same sense patients with drug or pollen allergy belong to the allergy family. In the reflex like type however, the situation is different. The etiology in this type of illness is varied. It occurs very frequently in the allergy family, but occurs very often in nonallergic families, due to the effect, I believe, of some disease which throws the heat regulating mechanism out of kilter. The heat regulating mechanism is very complex and requires for its normal activity, the coordinated action of a great number of structures. Structures of such vital importance as the sense organs in the skin, respiratory tract and internal organs for the perception of heat and cold; also a thermostat like mechanism in the mid-brain which responds to the sense of

heat or cold or a change in blood temperature, and in their normal response cause heat to be retained or expelled as indicated from the respiratory tract or skin. Normal regulation of heat loss requires, of course, the co-ordinated responses of the vaso-motor center, respiratory center and the entire cardiac vascular system and skin; finally, voluntary actions on the part of the individual which he brings into play when he feels too hot or too cold.

Sensitiveness to heat and cold is not frequently found in children and when found usually follows a febrile disease, usually measles or scarlet fever or chorea. Reflex like reactions become more common with age as one or another element, which plays a part in the regulation of body heat, breaks down and becomes ineffective. Very frequently however, we find individuals sensitive to heat and effort, or cold, in whom the most exhaustive physical examination discloses no cause for the condition except the fact that the illness is antedated by a febrile disease or other illness.

In writing my monograph on allergy, I introduced the term "Physical Allergy" as a non-committal word, under which the above diseases could be grouped. The term "Allergy" is non-committal, meaning nothing more than altered reactability. The term "Physical Allergy" meaning altered reactibility to the effect of physical agents indicated only what the literal translation of the term indicates. I do not assume that either type of physical allergy is or is not related to allergy, caused by egg, dander, and other material agents.

Physical allergy is very common and complicates many other illnesses, and is commonly found in patients who have allergy due to material agents. It rather frequently follows anesthesia, and over-indulgence in alcohol, in fact, in any condition which debilitates a patient to such a point that he does not respond normally to the effect of heat or cold. The condition is serious in every sense of the word unless correctly treated.

During reaction the patient is predisposed to infection and among cases of this sort, predisposition to coryza, bronchitis, and pneumonia is great. Relief of the condition is frequently associated with increased immunity, even against such organisms as affect the skin and respiratory tract.

In my experience, physical allergy has not been transferred passively, by either transfusion or by the Preuxnite and Kustner method. However, there are case reports by Sir Thomas Lewis, Hortan and Brown and several others of passive transference of cold sensitiveness.

7. *Contact Eczema.* There are several types of allergic eczema. The commoner type is that caused by reaction in the skin, causing dermatitis in the same sense that reaction in the bronchial apparatus causes asthma. This can be due either to sensitiveness to material substances, such as foods or to physical agents, such as heat or cold. There is however another type of eczema which seems to represent a different type of disease from any of those previously alluded to. This type occurs typically in the case of poison ivy dermatitis, primrose dermatitis, or ragweed oil dermatitis. The reaction is usually confined to the exposed parts, but in severe cases, this can spread to areas usually covered by clothing. It is apparently caused by the oily substances of the plant. It is typified by the fact that it can be induced artificially in normal or non-allergic people by contact with the oil. It can be relieved by weekly injections of the oil in tiny doses. It cannot be passively transferred by the Preuxnitz and Kustner method. Allied with this there is a type of physical allergy which causes a similar type of eczema of the exposed parts caused by physical agents such as light and which can be relieved completely by exposure of large areas of the skin to light of the wave length which produces the illness. All eczemas of this type appear in the form of delayed reaction occurring after a period of 24 hours or more but which persist for a week or ten days after removal of the cause of the trouble. In trying to account for eczemas caused by light we might imagine that the reaction is caused by the breaking down of some of the normal skin oils by light, and that the broken down substances sensitize the patient, and cause eczema when the substance is liberated again in the skin through the action of light. I have nothing to offer in proof of this attractive theory except what might exist in the fact that it can be relieved

by exposure of areas of skin to light other than areas subject to the reaction. This much resembles an immunologic cure. This type of dermatitis is rather common and may be extremely disagreeable. Relief may result in complete restitution of the affected parts if the cause of the illness is removed.

Causes of Reaction: Among the commoner causes of allergy regardless of type, may be mentioned briefly, light, dry pollen, foods, epidermal substances, spores and fungi including skin fungi, many constituents of dust, intestinal parasites, insect scales, insect bites, drugs, many constituents of smoke, bacteria, foreign sera, substances transmitted by blood transfusion. Also apparently substances of endogeneous origin, such as a patient's own breast milk, also specific physical agents, such as light, heat, cold and mechanical irritants. In addition to the above, there is a type of physical allergy which is postural, and which will be described at a later date.

Symptoms: Symptoms are so well known that they need not be repeated here in detail. They may be classified briefly as: generalized allergic shock, orbital symptoms, nasal, oral and pharyngeal symptoms, laryngeal symptoms, bronchial symptoms, gastro-intestinal symptoms, cutaneous symptoms, urological symptoms, pelvic symptoms, neurological symptoms, and miscellaneous symptoms such as hives, angio-neurotic edema, hypotension and certain cardiac and cardiovascular symptoms. Finally there are certain miscellaneous symptoms depending upon the site of reaction, which gives rise to symptoms such as headache, prostration, tremor, convulsion, delirium, bewilderment, phobias, coma, paralysis or asthenias and Meniere's syndroms. Many symptoms could be added to the above which have definitely been proven due to the direct or remote effort of allergy, and probably many additional phenomena will appear as proven effects of allergy when studies of the subject progress.

For a more complete review of the causes and symptomatology of allergy and of the means by which they can be proven allergic, the reader is referred to the vast literature which has been written on this subject.

Specific Diagnosis: There are two phases in the diagnosis of allergy, first, proof as to whether or not a given symptom is allergic in origin and second, which is much more difficult, discovery of the specific cause of the illness. As aids in the diagnosis of the first phase, may be mentioned a positive family and personal history of typically allergic symptoms dating from an early age. Recognition of one or more typical manifestations allergic in the patient such as nasal or bronchial allergy or hives, one or more reactions at the site of skin test. Finally the therapeutic effect of adrenalin; finally the effect of avoidance or of contact with suspected agents.

The discovery of the direct causes of a given reaction, is very much more difficult than proving the condition is primarily allergic in origin. This is especially difficult because the gross majority of patients, except infants, are sensitive to more than one agent, in fact, rather frequently to several or many agents. The situation is furthermore difficult because in the case of multiple sensitiveness one agent may cause reaction in one tissue while other agents may cause reaction of a different type located in other areas (Vaughn). This diagnosis may tax the ingenuity of a physician to an extreme.

The remoteness of the source of the evil can be illustrated by mentioning a patient sensitive to soy bean. He was not only made ill by inhaling soy bean dust in a mill and at home when the wind blew from the direction of the mill but also by the ingestion of milk or butter from cattle fed with soy bean fodder. He was also made ill by contact through artificial foods and oils containing soy bean products. The patient rightfully asked, why leave the mill when soy bean seems to be everywhere.

Cotton seed and linseed products, corn products and even castor bean products and fish glue are difficult of avoidance in highly sensitive patients. They have a distribution which makes complete avoidance difficult. Upon finding a primary offender in a given patient the reader may be surprised at what a good encyclopedia will disclose concerning its distribution and sphere of use.

Skin tests, while not infallible, are very useful in the diagnosis of allergy. They give useful information, especially in pollen cases, epidermal cases, dust and fungus cases, and in patients sensitive to insect scales. They are useful but less dependable than in smoke

cases, food and drug cases, bacterial cases, and in patients sensitive to sera.

Scratch tests used with glycerinated extracts offer the most practical means of testing which we have at the present time. Intracutaneous test should not be used by general practitioners on account of the possibility of terrific reactions. The method of testing can be made harmless however, by experts. An extremity should always be chosen for intracutaneous tests so that in the case of a violent reaction, the life saving tourniquet can be used. Many cases, especially those classified as contact dermatitis, do not respond to scratch or intracutaneous tests, but they give very strongly positive reactions to the so-called patch test, that is, a test made by applying the offending substance directly to the skin with the aid of adhesive. This should remain in situ for one or several days. Eczema under the material (excluding areas under the adhesive) indicates a positive reaction.

Elimination tests which eliminate specific foods with disappearance symptoms, is one of the most positive proofs of cause which we have at our disposal in food cases (Rowe) but should be verified by the finding of recurrence of the illness upon bringing the patient again in contact with the suspected substance.

TREATMENT

The effective treatment of a severe case of allergy requires more skill, knowledge and experience on the part of the physician than for any illness with which I am acquainted in the field of medicine; in fact, upon this depends the effectiveness of the result. I know of no condition in which bungling, or playing with a condition with which a physician is not acquainted, can do so much harm. If a physician has a broad common sense knowledge of medicine and training and experience in this line of work, a result can be obtained on an average which equals or excels those which surgeons obtain in surgical cases, or dermatologists obtain in dermatological cases; in fact, the results obtained in a minority of cases seem almost magic. The correct treatment of a patient in allergic shock, for example, appears almost like raising the dead. Furthermore, the correct treatment of a child with allergic eczema, who may be asthmatic, stunted in mind and growth and who may show allergic deformities in the chest and face, can be restored to normal in a year or two with such perfect success as to make the treatment of cretinism with thyroid extract seem a very imperfect therapeutic measure. I think the specific treatment of complicated allergy cases ought to be left to a specialist in the line just as operative surgery, operative otolaryngology, or orthopedic work ought to be delegated to specialists. I think in this connection it might be well to refer the reader to a portion of the Hippocratic Oath as follows: "With purity and holiness I will pass my life and practice my art. I will not cut persons laboring under the stone; but will leave this to be done by men who are practitioners of this work." This might be applied to the specific treatment of allergy. It would save many sad experiences for the patient which does neither him nor the physician much good; in fact it seems to me to be a professional mistake for a physician in one line of work to jeopardize his reputation by the mismanagement of an allergy case. The effect of this is unfortunately very obvious to the patient, neighbors and to the profession.

Unfortunately patients with allergy vary in their susceptibilities to such a degree that no fixed rule can be laid down which will apply to any gross number of cases. A majority of patients seem an exception to the rule, so that the skill of a physician experienced in the line seems to be needed in the average case.

Whereas, the specific treatment of allergy ought to be delegated to specialists, the common sense diagnosis of allergy and the use of the life saving symptomatic methods of treatment ought to be known to everyone. Allergic emergencies occur frequently in the work of general practitioners, and he should be equipped to recognize and meet the situation quickly and effectively. This may amount often not only to a most spectacular symptomatic relief but is frequently a life saving measure.

The effective and safe treatment of allergy depends upon the cause of reaction and degree of sensitiveness of the patient. We have at our disposal the choice of the following methods. Avoidance or removal of the specific causes of illness, avoidance or removal of contributory causes, specific treatment with the

agents to which the patient is sensitive, non-specific treatment, and finally symptomatic treatment.

Removal of Cause of Illness. The matter of removal of cause is not so simple as one would believe. If a physician has made up his mind that a patient is sensitive in a given substance it would be well for him to examine an encylopedia thoroughly and find out the uses and what are made of the suspected substance and its apparent distribution. This topic has been referred to previously.

Non-Specific Treatment is possibly indicated in certain patients. The mechanism through which it operates is speculative. I frankly believe a likely guess concerning its modus operandi would be an assumption that the benefit derived occurs partly at least as a result of the fever produced by it or of the slightly raising temperature from subnormal toward normal. Fever regardless of cause, is likely to relieve allergy for a time. Likewise the straightening out of an irregular subnormal temperature frequently gives relief.

Specific Treatment. It hardly comes within the scope of this paper to discuss specific treatment with agents proven to be the direct cause of the illness. Suffice it to say that the methods which appear most promising at the present time are the co-seasonal treatment as described by Vaughn and the perennial treatment as described by Stuart and by Black, modified as suggested by the writer with an addition of ephedrine and adrenalin to the treatment extract and its subcutaneous injection distal to a tourniquet. The latter procedure described briefly by the writer makes specific therapy prove safe in the hands of physicians who understand this subject, since the tourniquet, adrenalin and ephedrine holds the treatment solution local for a time and grossly slows down its rate of absorption. For details concerning the above procedures the reader must be referred to previous writings.

Symptomatic Remedies: Adrenalin—The use of symptomatic remedies is important. Adrenalin, if adequately administered, should give relief, in uncomplicated cases. It is a good practice to give about 0.25 c.c. or less subcutaneously at five-minute intervals until tremor appears. This usually means that an adequate administration had been given and that the relief should follow. After the dose which is most useful for the patient has been discovered, it can be repeated as symptoms tend to recur. It is advisable to give adrenalin in the incipiency of an attack rather than wait until the height is reached. Adrenalin can be given repeatedly, if the dosage is correct, for months or years without much apparent ill effect.

If one wishes a more rapid effect from adrenalin in an extreme emergency, it is advisable to give it intravenously or give a given total amount, say 0.5 c.c. or 1 c.c. in five or six places intracutaneously. Both of these methods give a very quick result. The intravenous method is probably the more rapidly effective and the multiple injection probably the more useful except in extreme emergency. If adrenalin causes heart pound or arrhythmia, its rate of dissemination from the site of inoculation can be controlled almost immediately by the application of a rubber tourniquet above the site of inoculation (Insley). The tourniquet can be removed after a minute or so and reapplied if indicated. As adrenalin reaction can be stopped within less than one minute as a rule in this way. The unfortunate feature of intravenous injections is that a dose once injected cannot be controlled, so far as rate of absorption and delivery to the tissues is concerned through the use of a tourniquet.

In patients who seem abnormally sensitive to adrenalin make the injection distal to a tourniquet. Remove the tourniquet after the adrenalin fixes itself in the tissues by vasoconstriction. This slowly absorbs and prevents sudden effects of overadrenalization such as headache, weakness, heart pound and tremor.

Pituitrin. Pituitrin has an effect that is somewhat similar to adrenalin except that relief does not appear so promptly. Relief so obtained lasts longer. It is useful alone or in combination with adrenalin. Some patients are sensitive to pituitrin.

Ephedrine. Ephedrine and allied bodies, given preferably in solution, has an effect similar to that of adrenalin except that the result does not appear so promptly but lasts longer. Very frequently constitutional symptoms are disagreeable and should be avoided if possible through reducing the dose to the smallest which will give a therapeutic result. Many patients are unable to tolerate ephedrine and

many do not get a good therapeutic result from it. A solution of ephedrine 3% (two parts) and adrenalin 1/100 (one part) is a useful solution for hypodermic treatment. If a tourniquet is used for a few minutes the rate of absorption of ephedrine can be slowed down to such an extent as to allow no constitutional effects.

Atropine. Drugs of the atropine series are time-honored remedies in the treatment of asthma. They can be given subcutaneously or by mouth. Sometimes as little as 1/200 or 1/500 grain three times a day is effective.

Iodides. The iodides are useful remedies, especially in older patients. The best dosage varies from a few drops to 25 or even 50 drops three times a day. Optimum dosage varies in different individuals.

Salicylates. Salicylates are very useful in treatment of nasal and bronchial reactions given in doses of approximately 10 grains every three or four hours. One must always inquire about sensitiveness to salicylates before advising their use or make the test described previously.

Anesthetics. The anesthetics, especially alcohol, are inclined to relieve asthma. Alcohol is frequently very useful especially if combined in fair dosage with acetyl salicylate. This combination is a useful substitute for morphine in many cases.

Habit Forming Drugs. Habit-forming drugs are absolutely contra-indicated except in emergencies which justify the chance of causing addiction. This applies especially to morphine. The hardest cases of asthma to cure are those which have become addicted to morphine.

The desirability of hypnotics in chronic allergy except in emergencies is debatable. I have seen some deplorable results from their prolonged use. One can say I think with fairness that allergy specialists who depend upon the frequent use of hypnotics are not serving their avowed specialty allergy.

Treatment of Physical Allergy. I have described the treatment of physical allergy at length in previous communications in the *Archives of Internal Medicine* and in the *Journal of Allergy.*

Treatment consists in contact cases of sensitiveness to light, cold or scratches, of applying the agent to which the patient reacts more or less generally until tolerance is obtained. Surprising results frequently follow correct treatment and failure or damaging results may follow careless treatment.

The treatment of reflex like cases is more of a problem but a problem which in many cases gives rise to a highly satisfactory result.

The treatment of heat and effort sensitiveness in well marked cases in a problem. The treatment of cold sensitiveness is likely to be a success and often a brilliant success.

Heat and Effort Sensitiveness. Patients who are chronically highly sensitive to heat and effort have to reconcile themselves to a handicap and adjust their habits and occupations to degrees of heat and effort which they can tolerate. They have to avoid situations and climatic conditions in which they are likely to be overheated. They can frequently obtain relief by living in a cool dry climate if they, in addition, avoid degrees of effort beyond their tolerance. A dry climate is often better for them than a cooler humid climate.

The immediate effect of heat and effort reactions can be very effectively relieved by cold and quiet. Frequently immersing the arms and hands in cold water is adequate. This does not always give immediate relief however, in cases of delayed reaction.

If sensitiveness to heat and effort seems to be a symptom secondary to some other illness, the condition can often be relieved in marked degree by treatment of the primary illness. However, in idiopathic cases, sensitiveness to heat and effort seem to persist in spite of health which seems perfect except in this one respect.

Agents which tend to keep body temperature at a high level usually give relief. The patients react most markedly when temperature is lowest so that the avoidance of gross subnormality in temperature is important. Temperature is inclined to be lowest in the early morning hours. Frequently a hot bath or exercise designed to raise temperature at midnight will prevent early morning attacks. Agents which cause fever, as a rule, relieve the condition temporarily whether the fever is caused by tonsilitis, pneumonia, typhoid fever, erysipelas or even, as in one asthma case, by a lung abscess. Fever can be given artificially through the use of certain vaccines, especially B. Coli, and occasionally the heat-sensi-

tiveness case can be definitely relieved through the use of repeated doses of vaccines which cause slight fever. In one desperate asthma caused by sensitiveness to heat, relief was obtained through the use of intravenous injections of colon bacilli which caused high grade rises in temperature. Asthma was relieved at the peak of the first reaction. This method of treatment is not without danger and is not highly recommended.

Hydrotherapy is very useful in the treatment of heat and effort sensitiveness. In highly sensitive cases it is very difficult to use heat without precipitating a reaction of some sort. Often a one second exposure to a hot lamp will precipitate a reaction which may result in a total loss of consciousness or a convulsion or result in twitching or violent asthma. For this reason heat and cold has to be applied in the beginning of therapy with great care. Frequently cold applied in a heat-sensitive case will cause shivering and the heat generated by shivering may cause reaction. For this reason both heat and cold have to be applied with equal caution. In the beginning of treatment it is frequently advisable to give bromides or adrenalin or both one-half hour before treatment is started. Heat may then be applied for a few seconds or more or possibly a minute or so until the patient begins to react. Reactions should be stopped immediately by applying cool cloths to the chest, arms and legs or if the patient can stand it a rapid rub with ice on the chest, arms and legs. As soon as the reaction has ceased heat can be reapplied. Care must be taken not to chill down the skin too much with ice. If it is done the patient does not tolerate heat so well when reapplied. This alternation of heat and cold can be continued at frequent intervals for a period of one-half hour and can be repeated daily and for a longer period of time as tolerance is gained. A high degree of tolerance for heat can often be induced within a period of two weeks or two months. When tolerance for heat is gained an effort should be made to induce tolerance for physical effort. This can be done through the use of exercise pushed to the point of causing slight reaction and stopped with cold. This can be frequently alternated and may be repeated many times daily in the beginning of treatment. A degree of tolerance can be obtained through this means which will not only develop emaciated muscles but change a bed-ridden invalid into a reasonably active individual.

Symptomatic remedies such as adrenalin, ephedrine, pituitrin, atropine, salycilates, the iodides may be useful in the treatment of this type of illness just as they are in the treatment of egg or pollen sensitiveness.

Sedatives such as bromides, alcohol and even chloral hydrates can be used to advantage in the early stages of treatment as a symptomatic remedy but should not be continued for prolonged periods of time.

Avoidance of mental depression and depressing environment is important. Depression apparently allows body temperature to fall to an unusually low level in many cases and can make the patient unusually sensitive to the effect of heat and effort.

Cold Sensitiveness. Patients who are sensitive to cold should be warned against exposure to cold which is beyond their tolerance. Certain ones can often be relieved through seeking a warmer atmosphere. This does not reduce their tendency to react to cold, however.

Treatment with graduated, gradually increasing exposure to cold gives a brilliant result in a large proportion of cases. This can be taken in the form of cold baths or treatment with heat lamps, alternated with ice rubs. A cold bath should not exceed over fifteen or thirty seconds in duration and should be followed, as a rule, by the drying and brushing of the skin with a stiff brush. An ice rub is a very effective method of treatment. If ice is moved rapidly enough over the skin it does not give rise to a disagreeable sensation of cold any more than a cautery gives rise to a sensation of heat if it is moved with sufficient rapidity. The entire body can be rubbed with ice within a period of fifteen or thirty seconds. in such a way that the patient need feel no sensation of discomfort from it. If this treatment is frequently repeated and gradually increased never exceeding the patient's tolerance, a high grade immunity to the effect of cold can usually be obtained.

Symptomatic remedies are useful in the treatment of this type of illness just as they are in the treatment of heat sensitiveness. The use of vaccines in this type of case is, I believe, illogical and unnecessary.

DIAGNOSIS AND MEDICAL MANAGEMENT OF THYROTOXICOSIS*

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The term thyrotoxicosis is employed to designate a clinical syndrome arising from the morbid activity of hyperplastic goiter (Graves' disease) and includes also so-called toxic or hyperfunctioning adenoma of the thyroid gland. It is a far cry from the original Merseberg diagnostic triad (exophthalmos, goiter and tachycardia) to the extreme elaboration and complexity of the present day. To read over the account of the symptomatology of Graves' disease as detailed in our standard text-books on Medicine is something of a task. For instance, in Blumer's Bedside Diagnosis twenty-one pages are required to set forth the sensory and motor disturbances and describe the organic secondaries which are more or less characteristic of thyroid dysfunction. The implication of all this extensive detail seems clearly to be that the entire organism—every tissue in the body—shares in the disturbance. That the symptomatology should be rich and varied is not surprising when we consider that no part of the mechanism of the body is exempt from the persistent over-stimulation of an elevated metabolism. Not only the clinical aspects of thyroid disease, but also every other condition having to do with its problems has developed under intensive study until an enormous literature has—and indeed still is—accumulating concerning Graves' disease and allied states. One may say that the medical profession has thereby been made "thyroid conscious" and, consequently, no appeal is necessary to awaken interest in these problems.

To approach the matter of diagnosis in a conventional way would be almost an insult to medical intelligence. In its fully developed form, there is no diagnosis easier to make than Graves' disease. Two items of the diagnostic triad—exophthalmos and goiter—are openly disclosed to even a casual glance, and other significant signs—tachycardia, tremor, hot skin, etc.,—are almost as easily apparent to the hand as are the first two to the eye. While it is true that there are very few diseases that have such a constant symptomatology, there is a discount against every individual single symptom—no one of them, not excepting exophthalmos or the elevated basal metabolic rate, is exclusively characteristic of the thyroid syndrome. It is the grouping of signs and symptoms and the general set-up of the case that determine the diagnosis rather than as was formerly believed the coexistence of certain definite phenomena. A few years ago, informative discussion was focussed about atypical forms of Graves' disease, the so-called "formes frustes" of the French authors. Today the well-informed clinician is quick to detect most of these cases. The residuum of obscure, masked cases that really present a difficult problem to identify is now mainly divided between the neurologist and cardiologist. To the former is most frequently presented the decision as to the thyroid background for obscure psychic and psychoneurotic deviations and in the hands of the internist lies the task of detecting the thyroid etiology of obscure auricular fibrillation or of congestive heart failure in middle life without other obvious etiology.

One of the most remarkable things about the development of our therapeutic attitude toward thyroid problems is the unanimity with which we now agree that they are surgical in their requirements and that medical cooperation—aside from diagnosis—properly consists of close association with the surgeon to secure timely operative interference. We may not know a great deal more about the true nature of thyroid perversions than was true of former times, but I think we are, in the main, agreed that, while we cannot eradicate what has escaped identification, we are at least able to control by surgery the morbid stimulation that creates such havoc in the body generally and especially in the cardiovascular mechanism. Perfected technic and preoperative treatment with iodine has lowered the factor of risk of thyroidectomy to a level comparable with other major surgical procedures. When I recall the controversial, and often acrimonious, discussions and the wide variance in opinion of other days and note the present settled agreement that prevails regarding surgical treatment, it seems to me that at last we have a clear

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course whereby we can guide our thyroid patients into smooth waters. That surgical removal of the thyroid is symptomatic treatment is no disqualification so long as we have no alternative to recommend that possesses equal merit. Means and Richardson in their very interesting little book on "Diseases of the Thyroid" (Oxford Medical Monographs) describe in a few illustrative tabulations the successive stages of their experience with methods of treatment in the Thyroid Clinic of the Massachusetts General Hospital, covering three successive four-year periods between 1915 and 1927. During the first of these three periods, from 1915 to 1918 inclusive, x-ray treatment was administered to 39.5%, x-ray with partial thyroidectomy to 19.0%, graded operations to 32.0% and one stage thyroidectomy to 8.0%. During the succeeding four-year period, from 1919 to 1922 inclusive, 51.0% received x-ray, 15.5% received x-ray and partial thyroidectomy, 22.0% graded operations, and 8.5% subtotal thyroidectomy. During the third four-year period, from 1922 to 1926 inclusive, x-ray was given to 9.5%, x-ray and partial thyroidectomy to 6.5%, graded operations to 14.0% and subtotal thyroidectomy to 60.5%. I quote these figures because it seems to me that they epitomize and express very well the change which has taken place in our attitude toward surgery as the method of choice.

The matter is no longer controversial. It has become conventional that thyroid surgery, properly safeguarded, is the proper means to employ to relieve the bodily mechanism of the strain that otherwise in its continuance will produce widespread organic wreckage. It is only the very mild and the occasional inoperable case that should be subjected to any prolonged medical treatment that has not for its purpose either preparation for the removal of the gland or the correction of residual disturbances following operation.

The administration of iodine in exophthalmic goiter to bring about remission of the toxemia has reduced post-operative acute thyroidism to a rare occurrence. The main risk nowadays lies in the direction of the heart which ordinarily determines the fate of the patient. The heart problem in thyrotoxicosis is our most important medical interest.

Hyperthyroid symptoms are mainly those directly or indirectly due to increased metabolism. Of all organs, that which is most likely to suffer from the stimulation of hypermetabolism is the heart. It seems to be the prevailing opinion that exophthalmic goiter causes more profound changes in the cardiovascular apparatus than is found in association with toxic adenoma. Since in both instances, circulatory wear and tear is induced by the same factor, i.e. over-load from elevated metabolism, the difference is not one of kind but rather one of degree brought about by the duration and intensity of the toxemia. Cardiac over-load appears to be proportional to the metabolism, if other things are equal. There is an increase in the minute-volume output of the heart and a greater velocity of blood flow through the lungs and tissues generally. As a necessary concomitant to this, there is vascular relaxation with increase in pulse pressure. This implies a wide open vascular stream-bed in which heart effort meets little resistance so that its dynamic output is mainly expended upon the increased frequency of the pulse rate rather than in overcoming peripheral resistance to the flow of blood. This probably explains why cardiac hypertrophy is seldom marked and congestive heart failure so infrequent, at least until the later decades of life, despite the increase in work demands on the heart. It is a surprising fact that the hyperthyroidism of itself produces no specific lesion in the myocardium (Rake and McEachern—American Heart Journal, vol. 8, no. I, p. 19). Weller, Wanstrom, Gordon and Bugher (American Heart Journal, vol. 8, no. I, p. 8), reporting a morphologic study of the hearts of 35 patients with exophthalmic goiter state that with but few exceptions, they found no gross or microscopic pathologic changes not equally represented in a carefully matched control series. The same thing they found to be true in 55 cases of toxic adenomatous goiter. It is conceivable however, that associated infections and other coincident unfavorable factors, acting on hearts subjected to prolonged functional over-strain, tend to be more damaging in their effects than in normal circumstances. It is generally agreed that duration of thyroid intoxication, rather than its intensity, is the important fact in causing heart impairment. This is illustrated by the higher incidence of

serious heart damage in toxic adenoma and, furthermore, supplies an explanation for the observation that thyroid cardiac disease is seldom, if ever, found to any notable extent in young people, but is preponderantly present in those of later life who have had their cardiac reserve already encroached upon by degenerative vascular changes. In 200 cases of hyperthyroidism observed by Andrus, cardiac decompensation was present in 18.5%. Its incidence increased in the age decades after forty. In 27 fatal cases with severe congestive failure, reported by Kepler and Barnes, coronary sclerosis, hypertension, syphilis or rheumatic carditis were present in 18 or 67%. In the remaining 9 cases, no cause other than thyrotoxicosis could be found.

Experience seems to indicate that congestive heart failure is rarely found in patients who have regular cardiac rhythm unless there is associated valve defect or myocardial degeneration from other cause than thyroidism. We are all familiar with the extreme heart and vascular reactions of exophthalmic goiter. Despite their extremely uncomfortable and often disconcerting intensity, they are apt to do the heart less damage than the milder but much longer continued stimulation of adenomatous goiter and, consequently, we find the rule that cardiac damage is more marked in this type. In adenoma, the toxemia may be mild at the outset and continue so for a number of years so that it escapes proper interpretation, yet all the time the heart is under extra load. Finally the patient appears as a cardiopath with congestive heart failure. These cases of unrecognized thryotoxicosis masked as heart disease have been interestingly discussed by Levine (Annals of Internal Medicine, Vol. 4, p.67, 1930). They may not have either exophthalmos or a visible goiter but complain of symptoms pointing to increasing heart disability and may eventually die of heart failure without the true nature of their trouble being discovered. The importance of small nodules not easily discovered in the thyroid is often overlooked and an x-ray examination of the chest which might have revealed a substernal goiter may not have been made. Because the physical findings in the heart in mitral stenosis closely resemble those present in hyperthyroidism, these two conditions are often confused. When such patients reach the stage of congestive failure, they may continue to live far longer than one might expect. For their identification, we must employ somewhat different criteria in the examination and interpretation of symptoms than those customary in pure cardiopathies. The symptoms may include such suggestive items as warm flushed skin, unexplained perspiration, inordinate loss of weight despite an excellent appetite, a certain kind of fidgety nervousness and, on the part of the heart, continued rapid and regular rate, which fails to slow properly after digitalization, paroxysmal runs of auricular fibrillation, loud staccato heart sounds, a rather harsh systolic bruit at the base in the pulmonic area, marked chest vibration simulating a thrill. Electrocardiographic anomalies are frequent but not characteristic. Krumbhaar (Amer. Jour. Med. Sc. v. 155, p. 175, 1918) recorded the findings in 51 cases of toxic goiter. Changes in the T wave were noted in certain cases showing progressive muscle damage, but the most characteristic things were the arrhythmias, heart block, premature contractions, auricular fibrillation and auricular flutter. Of all causes, thyrotoxicosis is the most frequent for auricular flutter. Probably many of the attacks of palpitation which these patients describe are due to cardiac arrhythmia. He considered changes in the T wave to have a bad prognostic significance. If suspicion is aroused regarding the possible existence of thyroid heart disease, a basal metabolic test should be made. If this is found to be in excess of 20 above normal, after careful checking, the thyroid may be considered at fault. Further confirmation of this belief may be secured by a careful therapeutic test with iodine.

One striking and peculiar feature about the thyroid heart is its tendency to develop auricular fibrillation and this is more apt to be transient and paroxysmal than when due to other causes. In Wilson's series of 108 cases of thyroid with auricular fibrillation, 23% were paroxysmal. It is considerably more common in adenoma than in exophthalmic goiter. Fibrillation may be the first manifestation of thyroid disturbance, even before there is any significant elevation of metabolism. Every patient, especially if nervous and of spare habit, who comes under observation, with a grossly irregular pulse, who has not demonstrable mitral

disease or other recognizable cardiac pathology, should be suspected and a basal metabolism rate made. It is advisable to examine these patients carefully in the sitting position as a small adenoma may escape detection if the patient is examined only while lying. The possibility of a substernal or thoracic goiter should be kept in mind and the x-ray employed if there is any doubt on this point. Even the absence of any significant elevation in metabolism does not necessarily exclude the thyroid factor. Morris warns about this possibility and relates three interesting cases in point. These were patients with long existing adenomas. Hypertension was present. Morris's chronic cardiopaths were restored to efficiency by thyroidectomy.

A rare happening may be a thyroid heart without tachycardia, provided some counteracting factor producing bradycardia coexisted as, for example, complete heart block (auriculo-ventricular disassociation). The electrocardiograph will explain this inconsistency. A few such cases are recorded in the literature.

Considerable difficulty may arise in distinguishing between cardiac neuroses and the fast beating and erratic heart of thyroidism. Neurocirculatory asthenia and hyperthyroidism have been much confused. We have at our command to set at rest this doubt the metabolism test and if that fails to clarify the point, the trial with iodine as suggested by Plummer. It may prove difficult to secure a satisfactory metabolism reading because standard basal conditions are often difficult to secure in the neurotic individual. By checking and rechecking the test on different occasions such patients usually grow sufficiently accustomed to the technic to permit a reliable reading. If this falls eventually to within ten per cent of the standard figure, one may conclude that no important thyroid factor exists. Should a differentiation not be possible by this means, iodine may be cautiously administered in small doses. The thyroid factor yields promptly and significantly, especially in hyperplastic goiter, the pulse declines, and the nervous symptoms are markedly ameliorated. In cardiac neurosis, similar improvement is not observed.

The foregoing constitute a few of the many considerations that might be instanced to emphasize how importantly the heart is concerned in the diagnosis of thyroidism and how inextricably it becomes involved in the prognosis of the case. Continuance of the thyrotoxicosis unchecked progressively detracts from the patient's efficiency and, in the long run, will result in functional insufficiency of the heart from overwork. Not that the outlook even then is particularly bad, for it is well known that the thyroid cardiopath is very tenacious of life. Many years ago before thyroid surgery was born, Trousseau said that the exophthalmic goiter patient never was cured and never died. Nowadays, fortunately, there is a better fate in store for these patients. Not only may their efficiency be improved by medical treatment, but through suitable resection of the gland, the way is opened up for complete recovery. It is now well known that, if the thyroid is primarily at fault, the most satisfactory treatment for the exhausted heart of thyrotoxicosis is to remove the overload by thyroidectomy. The point of fundamental importance is that in this type of heart trouble, we can delete the hypermetabolism and the extra circulatory work it calls for. When this is accomplished, the heart disturbances, for the most part disappear, even when a high grade of heart failure has developed. Formerly, the existence of serious heart embarrassment was regarded as a contra-indication to operation. It is now regarded as increasing the desirability of resection of the gland. Assuming that this conclusion is no longer open to controversy, I propose to devote the remainder of this discussion to a brief consideration of the means to be employed in the preparation of the patient for operation. I shall not dwell upon such general and well recognized measures as rest, sedatives, high caloric diet, etc., all of which play an indispensable role in the management of these cases. The skill of the therapist in this matter depends on how well he has mastered the technic of iodine, digitalis and quinidine.

Iodine for goiter is one of the oldest remedies of which we have any clear record, having been used for that purpose long before the days of Hippocrates. It remained for Plummer, within very recent memory, to rationalize its employment. The accepted principles of iodine therapy, as they stand today, may be summarized as follows: The favorable effect induced by iodine consists of a fall in basal metabolism with corresponding immediate improvement in pulse

rate, nervous excitability, nutritive status, etc. This response is most strikingly apparent in hyperplastic goiter, so much so, indeed, that it constitutes one of the earmarks of exophthalmic goiter and when it does not occur in some measure, one is justified in suspecting that the case is of different type and not a true Graves' disease. The beneficial effects to be derived from iodine may be marked but they are temporary. If the use of the drug is persisted in beyond a certain time, metabolism rises again to its former level or higher, and the patient usually remains refractory to iodine for a varied but considerable period. It will be seen from this that the benefits to be derived are limited while the harm to be done may be serious. Iodine does not correct or abolish the cause of the morbid stimulation of the thyroid so that no lasting benefit accrues from its use. According to Marine, the mechanism for the temporary beneficial effect of the drug is to produce a pressure retention in the alveoli by means of a rapid accumulation of colloid. This functional block proves but temporary, lasting only until the thyroid cells have accommodated themselves to the increased tension, after which excretion is reestablished and metabolism begins again to rise. It may be confidently expected that this iodine remission will attain its maximum in from 8 to 12 days. If the drug be continued, the improvement with gain in weight lasts about 3 weeks. Then there is a gradual recurrence of symptoms which may increase until they are worse than at first. It is found that if the drug is stopped during the period of remission, there will occur within a week or so a return of symptoms which may be temporarily suppressed again by the use of iodine. Bearing in mind this very definite cycle of events, from bad to good and then again to bad, iodine administration in exophthalmic goiter should be reserved to produce remission for surgical removal of the thyroid. According to Thompson & Thompson, the preoperative employment of iodine has reduced the mortality in the leading clinics from 1-4% to 0.25-0.7%.

There is no fixed rule as to dosage unless it be the rule of practical experience; i. e. to give enough to secure the result sought for. Plummer advised large doses; others have found much smaller amounts accomplish the purpose quite as well. It is only fair to state that large doses do not appear to exert any harm and as the drug is used for a short period only, it is not necessary to cavil about the dose. The operation is best undertaken on from the fourth to the sixth day of remission and the drug should be continued for three weeks longer in gradually diminishing dosage. If a postoperative crisis seems pending, it should be given boldly, either intravenously or by hypodermoclysis in salt solution.

Among the striking effects of the preoperative use of iodine is a greater tolerance to anesthesia and a greatly improved mental state, both before and afterward, so that the patient is less emotional and restless and more easily controlled. More important still is the control that it exerts over the dreaded postoperative thyroid crisis which formerly took so considerable a toll of exophthalmic patients. If thyrotoxic manifestations show no sign of diminishing under iodine and especially if they appear to grow worse, operation should be postponed as patients in this phase may die of postoperative acute thyroidism. If residual symptoms of hyperthyroidism persist following thyroidectomy, the effect of iodine in small doses should always be tried. It rarely fails to give some relief; at times complete.

Unfortunately, we do not have as clear a justification for the employment of iodine before operation on toxic adenomatous goiter. It is well known that iodine may exert a very disturbing effect in adenomatous goiter. General experience supports the observations of Plummer that a considerable per cent of toxic adenomas have been thrown into hyperfunction by the therapeutic use of iodine. Marine concludes that most, if not all, the instances of the alleged production of Graves' disease by the use of iodine that have appeared in the literature have occurred in predisposed individuals and have been due to the abuse of iodine. It is clear that we run some risk of increasing, rather than reducing, the toxic activity of adenomas by the use of iodine. The preoperative program in this type of thyrotoxicosis must, consequently, be somewhat different from exophthalmic goiter. First of all, we must be clear about which form of goiter we have to deal with. This is not always an easy matter. The nodular character of the thyroid will distinguish adenomatous goiter readily enough from the smooth symmetrical enlargement of the gland in Graves' disease. Difficulty arises here at once due to the fact that about one-third of

the patients with exophthalmic goiter have adenomatous masses in their thyroid glands (Boothby). Consequently a careful analysis of all symptoms and an accurate history are necessary to decide the diagnostic problem. One strong point appears to be the presence or absence of exophthalmos. Of 1656 cases of goiter tabulated by Boothby (in Oxford Medicine), exophthalmos was present in 61% of exophthalmic goiter patients, whereas it existed in very minor degree in only 3% of toxic adenomatous patients. About 5% of adenomatous goiters are of mixed type; that is, there is also coexisting hyperplasia. This condition may be suspected if there is exophthalmos, an unusual degree of nervousness and sweating with an unexpectedly high metabolic rate. These individuals will be rendered more secure by means of the preoperative administration of iodine but they are not easy to identify with certainty. Even if there be no hyperplasia present but the case is one of pure adenomatous type, experience has shown that little harm will result from iodine over the short period of time that the drug is to be used, provided the dose is not pushed to extremes and the effect on the metabolism is watched carefully. If the expected response does not appear within a period of ten days, iodine should be discontinued.

The chief medicinal therapeutic problem in adenomatous thyrotoxicosis is the care of the heart. As previously noted, this type of thyroid perversion, because of its insidious development, and long duration, is apt to produce a good deal of cardiac wreckage so that the patient may be frankly a cardiopath when he comes under observation. Direct cardiac medication has little place unless the heart is grossly insufficient. Digitalis does not often slow the rapid regular heart of thyroidism. When signs of congestive failure are present, with or without fibrillation, digitalis must be given and the same rules that govern its employment in circulatory failure from other causes apply in this case, although the benefits to be expected are usually not so great, requiring larger doses with less effect. This is especially true during severely toxic periods. For fibrillation without insufficiency, digitalis is of doubtful value. Some observers believe that digitalization previous to operation increases the operative risk. However this may be, my impression is that there is a certain security afforded by digitalis therapy before operation and that there is decidedly less likelihood of the occurrence of postoperative fibrillation. Perhaps the same effect may be secured by one or two doses of quinidine daily for several days before operation. If auricular fibrillation is present, either before or after operation, and digitalis fails to shunt it back under sinus control, quinidine therapy is in order. It may be tried with every safeguard, but the continuous stimulation of the toxic thyroid which has brought the fibrillation about is a serious handicap to its action and it may fail in its effects. The drug is distinctly more effective in its ability to control fibrillation after the thyroid has been removed. According to Anderson (American Heart Jour. vol. 8. 1. p. 133) approximately 45% of patients with fibrillation spontaneously acquire a normal rhythm within four days after operation and about 15% if allowed to go untreated. The remaining 40% would continue to fibrillate if left alone and not treated with quinidine. In order to obtain the best results with this drug, it should be used from the third to the sixth day after operation and success can be anticipated in from 90 to 96% of cases. If treatment is delayed longer than this, the percentage of failures increases considerably.

If auricular fibrillation is present, every effort possible should be made to bring it under therapeutic control before operation is undertaken as it distinctly enhances the surgical risk. In the series reported by Barker, Bohning and Wilson (Amer. Heart Jour. vol. 8. 1. 121, 1932) mortality from operation in the presence of auricular fibrillation was 22%. This high mortality is offset by the fact that their cases of auricular fibrillation that had other forms of therapy without operation died to the extent of 35%. These observers consider the degree of improvement secured to be strongly in favor of surgery because many of the patients who recovered from operation were restored to practically complete health and efficiency whereas none of those who did not have thyroidectomy is known to have satisfactorily recovered.

Other authorities report postoperative return to normal rhythm in from 40 to 65% of cases. It would appear that auricular fibrillation, occurring in association with thyroidism, is caused by a toxic factor which is eliminated by operation, allowing the heart to recover sinus control.

Before closing this decidedly discursive discussion, I want to revert to the good results secured by the routine administration of small doses of iodine in occasional mild cases of thyrotoxicosis. Means refers to these cases and I am sure it is a part of everyone's experience to now and then see a mild but undoubted thyroidism kept nicely under control by a drop or two of Lugol's solution each day or even less frequently

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MEDICAL PRACTICE IN 1950*

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Seemingly it must be a bold man who, in the face of present conditions, would attempt to predict the status of the practice of medicine 17 years hence.

To the casual observer changes have been so striking during the past few years that he would be justified in believing that there might be even more momentous changes during the next two decades. Whatever these transmutations may be, one fact seems to stand out clearly in conversations with various people who are giving these matters real thought. That is, the general practitioner will be the center around whom the practice of medicine will revolve in the future.

We have heard much about the disappearance of the family physician, and it must be admitted that in certain parts of the country this lovable, dependable, useful friend, counsellor and physician has largely dropped out of sight. Many of the members of the rising generation know him not, but older persons realize that the unusual relationship which existed between physician and patient is one with which we cannot easily dispense. The patient, not the physician, is the loser. The people knowing this fact are seeking its correction. Consequently, it is apparent that the pendulum which once swung far toward specialism is now gradually coming back, and I doubt not that in 1950 the general practitioner will be well advanced toward that position which his predecessors occupied.

One of the great reasons why there will not be the tremendous changes in medicine predicted by some, is that we cannot easily alter the nature of man. The ill patient desires the attendance of that type of physician who will minister to him in a personal manner. Technique and treatment is, or should be, of the most modern type, but the patient desires to feel, and indeed he must feel, if he is to obtain the best results from medication, that the physician regards him as a distinct and definite entity, as a friend as well as a patient. In other words, the patient wants to give the doctor his complete confidence, but to so do he must know that the doctor is attuned to him.

It should not be understood I am predicting that medicine will stand still. Nothing good remains stationary. Unless we progress we regress. There have been striking changes in medicine since my student days.

I hark back to the time when the automobile was nebulous; when the telephone was a luxury possessed by the elect; when laboratories were sketchy and when some men still believed in "laudable pus." Today, the motor car has tremendously increased the physician's radius of action; the telephone has practically placed the doctor in the room of his patient who may be many miles away. Bacteriology and pathology have revealed to us new and undreamed of worlds. Therapy has been metamorphosized.

Physicians in the larger places have congregated in office buildings, thus permitting greater cooperation among themselves, and giving unusual advantages to the patient. Improvements in diagnostic and therapeutic apparatus and in medicinal agents are almost unbelievable. We have today instruments of precision undreamed of by the practitioner of a half century ago. We also have observed the great change in the economic conduct of medical practice. Physicians are realizing the necessity of applying business principles in a reasonable degree to their daily work.

When we consider these thoughts we observe that medicine has progressed. We believe also that along these lines it will continue to advance, because the keen analytical minds of men will always find new and improved methods of solving the various medical and surgical problems which come to the attention of the physician.

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As the result of all these improvements the mind of the medical man can encompass a much wider professional knowledge. In other words, all this progress has made it possible for one man to carry out a greater range of activity in medicine.

I make bold to predict that 100 or 500 years from now, and as long as medicine continues to be practiced, we shall have the general practitioner, and as his knowledge increases through the betterments in diagnostic and therapeutic measures, he will be more capable of carrying on his work and giving to his patients that perfection of service which the patient expects. In other words, the general practitioner will be a much more competent physician than have been the majority of his predecessors.

We also trust that his rewards will be larger. That is a matter very largely in his own hands, because the wise physician will discover his own economic problems, will devise ways to meet them, and will adopt means to make his particular kind of service more eagerly desired.

This does not mean that there are not men in practice today who have carried out this very thought. I have in mind a physician who, 20 years ago, located in a small suburban town, within commuting distance of New York, and 10 or 12 miles from the county seat. He was graduated from a good medical school and had the usual internship, but possessed no qualifications which would make him outstanding in the eyes of his fellows. He early found that if he were to be a success in that community he must attend satisfactorily to the medical necessities and demands of the people, and prevent them from going to the county seat, or to consulting physicians in New York. He set about to attain this end in a most business-like way.

His office soon contained the various instruments of precision which are necessary in arriving at a proper diagnosis. A competent nurse aided him. He took frequent post-graduate courses in Manhattan. He believed that his services were worthy of proper compensation, and he educated his clientele to that fact. The result is that even in these times of depression his practice has been very large, demanding an assistant and several women in his office, and while he lays claims to no superior knowledge, he does insist that he gives his patients definite and effective service. He has applied to his daily endeavors the very best in the art, science, and economics of medicine and has been markedly successful.

This emphasis on the general practitioner might indicate that in my opinion specialism is on the wane. We will always have specialists, because there are forms of medical practice which should be carried out only by men who have devoted much time and serious attention to that particular type of work. I feel, however, that ultra specialism, which we have noted during the past few years, will eventually give way.

We have been alleged to have reached such a fine point in specialism that a patient who called upon an otologist for treatment of an abscess in the right nostril was told by that gentleman that he must consult another specialist, as his own efforts were confined exclusively to the left nostril.

Be that as it may, as the general practitioner improves his knowledge of at least the more usual ailments of the human body, he will, I believe, take care of many of the conditions which at the present time are being handled by specialists.

Every person should be under the observation of a skillful practitioner. I am a firm believer in periodic health examinations. The span of life has been lengthened materially since physical examinations became a fact and not a fad. Preventive medicine is playing a tremendously important part in the life of the nation, and if our medical schools will lay sufficient emphasis upon the necessity of carrying out preventive measures, some of our people may be able to become rivals of Methuselah.

The advantage which the general practitioner has in connection with his patient is that close observation of the individual gives him a broad perspective. It enables him to be familiar with the person's individuality and functions and general make-up. To use a homely expression, the doctor is thus enabled to "know the patient's constitution." The better we may know that so-called constitution, the more comfortable will the possessor thereof be, and the longer will he remain in this sphere of action.

There will, nevertheless, be a change in the methods of the practice of medicine, particularly among people who are dependent. If we were to listen to the dicta of certain groups,

very largely composed of laymen, we would start in now to socialize medicine. If medical practitioners were of the type of some of their confrères abroad, such a state might eventuate. I cannot conceive, however, that a majority of our medical practitioners will permit themselves to join a Krankenkasse, or to accept a panel of patients.

This is not the time nor place to discuss state medicine abroad, but those of you who have followed up the subject, and particularly those who have observed its workings in European countries, realize that it is not for the American physician nor for the American people.

My own feeling is that by 1950 we shall have a system of part *private* and part *public* practice. By public medicine I mean what is ordinarily called "state medicine," a term which is actually a misnomer in that it may be furnished by the municipality or the county instead of the state or nation.

I believe that the portion of the public now being treated gratuitously by physicians, either in their private practices, or in the clinics, or in the hospital wards, will be eventually grouped together and cared for by the state, county, or municipality, and that the physicians who minister to the indigents will be on salary paid from taxation. The private practitioner will thus be automatically relieved of a great and difficult burden.

We will, therefore, have two types of practitioners: the private physician, who will continue to function as heretofore, and the public physician, who may or may not have a small private practice, but whose major duties will be to care for the needy classes on a strictly salaried basis.

There are many men in the profession who possess characteristics which would make them successful only in private practice, and these men would constitute the private practitioners, both general and special. On the other hand, we have men quite as well educated, and as scientifically sound, who for one reason or another would be able to work effectively under salaried conditions. Those men would practice public medicine on salary.

If this plan can be successfully carried out we can be assured that the poor will receive the personal attention they deserve at the hands of the men who are properly compensated, and that other people who can afford to pay the physician will employ the private practitioner.

Some economists have felt that the problem of private practice in the future would be solved by the private groups, or the diagnostic clinics.

A few years ago this form of practice seemed to offer a means of solution, but many people are believing now that group practice has seen its heyday.

The Journal A.M.A., for May 27, 1933, indicates a slowing up in the rate of growth of groups, and shows that the percentage of physicians entering group practice has not increased during recent years.

It seems to me that as the years go on, while there may be an increase in the number of these groups, it will be due largely to the increase in population.

I know of the dissolution of a number of such organizations, but we cannot say that this ending has not been due to the depression rather than to the inability of the group to serve its clientele satisfactorily. A close observer, and one who is in a position to study group practice, says that many group patients are going back to the individual physician, because they are feeling that although they may only see one or two physicians in the group, all the members participate in the fee, and that, therefore, the fee must be exorbitant,—a fact which probably is not true.

Health insurance has been regarded by some as an important factor in the determination of the type of practice of the future. If we could make certain that every patient would not only take out an insurance policy on his health, but would pay the premiums regularly, so that in time of illness he could be cared for by his family physician, or could be sent to the hospital if necessary, and that the insurance company would meet all the expenses, the doctor's situation would be a happy one. But can we depend upon the patient?

The most difficult selling task American salesmen have ever undertaken has been to make the man in the street life insurance minded, and they still have far to go. The average person believes that illness will not overtake him, although it may his neighbor. I am convinced that it will be a herculean

effort to sell the subject of health insurance to the American public in its entirety.

Radical changes will not come upon us rapidly. Even though there will be developments in the matter of public medicine, there will still be an abundance of opportunity for the private practitioner to continue his work in caring for the health of the majority of the people, that is the private patients. When the community will remove the burden of charity and semi-charity which handicaps the physician, the great waste, now associated with private competitive practice, will largely be eliminated, and people of all classes will receive more thorough and painstaking treatment than is the case today.

Whether we look at medicine in the year 1950, or the year 3000, we cannot escape the fact that the true physician will be as he has been since the year 400 B. C.

He will not be the man who regards the patient as a living machine—a human robot. The developments in psychiatry and mental hygiene will not set aside the fact that we must have an essential, personal, almost priest-like confidence and understanding between patient and physician. There are many cases, to be sure, which require this relationship to a lesser extent, and the mass production idea will apply to them.

The true physician cannot be driven by the lash of a master, or a system of rules. Rather he is one who seeks to aid mankind in times of stress, and possesses the will to serve.

But if he is to have the opportunity to fulfill this ambition he must possess another qualification—or rather he must acquire one other trait—and that is the ability to present his desire to assist in a more favorable fashion. We might go farther and call this ability salesmanship.

The proper type of physician must exemplify the spirit of craftsmanship. We should draw a more distinct line between medical practice as a craft and the type which is practiced as an industry. Physicians who attract the public must be of the first type.

Craft, art, patience are of first importance. Where can you look and not see physicians who are putting aside the hope for great emolument in order to serve those whom they term as "their people"? Those men are rich in those things which constitute the very best in life. They are heroes who die, unheralded and unsung, but not without the very deep and sincere kind of thanks of those whom they have served. And with such practical physicians as these the medical profession is replete.

The entire world is in the throes of a period of transition. Physicians are learning the comparatively new science of economics, and are applying it to their problems. When they emerge from this period we will find medicine essentially as it was before. Human nature changes but little in the course of the centuries. The objective aspects of medical practice may be somewhat different, but the changes will not be violently radical. In 1950, yes, eons hence, physicians, as now, will stand and serve.

HOW LARGE IS A TEASPOON?

In a recent number of the *American Druggist* there appeared the following:

"Physician directs a teaspoonful. You write it on the label. Pick up some of the teaspoons in your own home. Measure the capacity of each. Note the difference between what one holds as against another. Obviously every teaspoon used for administering medicine should be a standard teaspoon. What are we to do about this?"

Now that the druggists have taken up this question, it seems pertinent that the physicians should do the same. We shall be glad to hear from our readers exactly what they think of this question.

It is interesting to note that an announcement from the Drug Trade Bureau of Public Information says:

"For a few cents the family medicine chest can be supplied with a graduate 'medicine glass,' thus avoiding possible 'over-doses' or 'under-doses' in the administration of medicines."

This warning is one of a series of suggestions relating to the handling and administration of medicines in the home, issued in connection with the observance of First-Aid Week. Some of the suggestions are as follows:

"Never take medicine in the dark.

"Always look at the label and read the directions before taking a dose of medicine.

"Never increase the dose or take it more frequently without consulting your physician.

"Pour from the bottle with label upward. This keeps the label clean and legible.

"Never take medicine originally intended for others; the drugs it contains may be entirely unsuited for your condition and be actually harmful."

DIGITALIS

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Digitalis has for the past three hundred years been the most popular and the most valuable single remedy for the treatment of heart disease. It is without a doubt one of the great drugs in possession of the race. Yet no one knows who discovered digitalis or when it was discovered. As a matter of fact when it was first used as a remedy it was for other than its cardiotonic properties. Its first use in medicine goes back to the Anglo-Saxon period where it was mentioned in the "Leechdoms" of the twelfth century. In those days it was called foxglove, which is derived from the Anglo-Saxon foxesglew, i.e., fox music, an allusion to the ancient musical instrument consisting of bells hung on an arched support. It was mentioned in the "Liber Medicinalis" of Apuleius, and in the "Vocabulary of the Names of Plants" of the eleventh century, as foxes glofa, while in a later vocabulary it was called foxesglove.

The ancient Welsh "Physicians of Myddvai" made frequent use of foxglove. It appears as an external remedy in a treatise of the year 1250. Fuchius described it in his "Plantarium Omnium Nomenclaturae" in 1541, and gave it its present name of digitalis, in allusion to the German *fingerhut* (finger-stall). A year later he gave it its present botanical description. He described its flowers as ranging from white to purple and gave it the name of digitalis purpurea which it still retains, and which, as is quite obvious, is not a very accurate designation.

In the sixteenth century it passed into the "Herbals" and was mentioned by Turner, and by Gerarde in 1597, who stated: "It doth cut and consume the thicke toughenesse of grosse and slimie flegme and naughtie humours." In 1640, Parkinson observed its value in "extenuating tough flegme or viscous humours troubling the chest," and remarked further that "there are few physicians use it and it is in a manner wholly neglected." Ten years later, however, it was included in the London Pharmacopoeia, which shows it had found a place in the materia medica of the physician of that period. Previous to its first inclusion Lobel mentioned that "the country people of Somersetshire employ a decoction for the cure of fever, but its operation is exceedingly violent."

It was chiefly employed in the treatment of epilepsy and as an external application for scrofula or the King's evil, as well as for wounds and ulcers of the legs. In a manuscript book of medical receipts written in 1644 the following formula is given for "An Oyntment for King's Evil": "Stamp a peck of fox gloves in a stone mortar and add to it a pound of fresh butter and set them on a soft fire for four hours to make the oyntment." Another: "Against ye falling sickness take purple foxgloves, 2 handfuls of the leaves with 4 ounces of polipodium of the oak. Boil them in beer or ale and drinke ye decoction. One that had the disease 26 years so that he fell with it 2 or 3 times in every month, was so cured by ye use of this decoction that he had not a fitt for 16 months after."

In the 18th century, the great Boerhaave considered foxglove to be of a "poisonous nature," and Haller observed that "6 or 7 spoonfuls of the decoction produced nausea and vomiting."

Around the year 1775, in the county of Shropshire, England, an old woman was making a wonderful reputation with a remedy which was remarkably effective in curing dropsy. Her fame had spread far and wide, for her decoction was really effective, though its composition was a secret. In the same year a practicing physician in the Midlands, William Withering by name, was impressed by the fact that this old woman "had sometimes made cures of cases of dropsy after the more regular practitioners had failed."

Dr. Withering was determined to investigate and at length succeeded in ascertaining that "The medicine was composed of twenty or more different herbs but it was not very difficult for one conversant in these subjects to perceive that the active herb could be no other than the foxglove." That very year he began his study of this remarkable plant. "I soon found," he wrote, "the foxglove to be a very powerful diuretic, and so in the Botanical Arrangements, published in the following spring (1776), I ventured to assert that the Digitalis purpurea merited more attention than modern practice bestowed upon it. . . The more I saw of the great powers of this plant the more it seemed necessary to bring the doses of it to the greatest possible accuracy. . . In the Summer of 1776 I ordered a quantity of the leaves to be dried and as it then became possible to ascertain its doses it was gradually adopted by the medical practitioners in the circle of my acquaintance.

"In February, 1779, my friend, Dr. Stokes, communicated to the Medical Society of Edinburgh the result of my experiments of the foxglove. At length in the year 1783 it appeared in the new edition of the Edinburgh Pharmacopoeia, but from which, I am satisfied, it will again be very soon rejected if it should continue to be exhibited in the unrestrained manner in which it has hithertofore been used in Edinburgh and in the enormous doses in which it is now directed in London."

In 1785 Withering published his thesis "An Account of the Foxglove and Some of its Medical Uses, with Practical Remarks on Dropsy, and Other Diseases," which ranks with the classics of medical literature. It gave the clinical histories of 163 of his own cases and many "Communications from Correspondents." Complete directions were given for the gathering, stripping, drying and powdering of the leaves. Regarding dosage he had this to say: "I give to adults one to three grains of the powder twice a day. Sometimes I give the powder alone, sometimes unite it with aromatics and sometimes form it into pills; if a liquid is preferred, I make an infusion. . . Patients were sometimes ordered to persist until the nausea came on and then to stop. But it soon appeared that the diuretic effect would often take place first, and sometimes be checked when the sickness or purging intervened. The direction was therefore enlarged thus: Continue the medicine until the urine flows or sickness or purging takes place."

The "Account of the Foxglove," concluded with nine "Inferences," the last three being so remarkable that they are worthy of reproduction here: "That the digitalis may be used with advantage in every species of dropsy, except the encysted. That it may be made subservient to the cure of diseases unconnected with dropsy. That it has a power over the motion of the heart, to a degree yet unobserved in any other medicine, and that this power may be converted to salutary ends."

When physicians began to become acquainted with the clinical efficacy of digitalis and began to employ it in cardiac disease, chemists attempted to learn something of its chemical composition. Among the first to note an attempt to unravel the chemical mystery of this new drug was Thompson in his "London Dispensatory," 1811, who alluded to the fact that Destouches established inorganic compounds of calcium and potassium, while Radig found potassium acetate in the plant. Thompson himself made a personal examination, establishing "a deep green resinous matter, in which its narcotic power resides." Leroyer, of Geneva, afterwards gave the names of digitaline and digitalia to a material made by a circuitous chemical process, in which it is questionable whether the final product had any place in the original drug. Thompson sums it up as "an extractive mixture," adding that "the active principle of digitalis is unknown."

Then followed more chemical investigation, notably by Walz, Kosmann, Momelle and Quevenne, Nativelle and Schmideberg. It was the last named chemist who first studied the active principles in digitalis and found that at least three active glucosides could be obtained, which he called digitoxin, digitalin and digitalein. These glucosides were decomposed by heating with acids and broke up into glucose and a complex molecule.

Strange as it may seem, so remarkable a discovery as digitalis failed to gain a firm hold in the practice of medicine during the early days of its discovery. It was Sir James Mackenzie who in 1905 rediscovered Withering and brought his work before the medical profession and established the correctness of his teachings concerning the administration of digitalis. At that time the study of digitalis began in earnest.

In spite of brilliant chemical research the nature of digitalis still remained a mystery. Attempts to determine the therapeutic value of the drug by chemical methods of assay have proved disappointing. This led to the introduction of pharmacological estimations based on the reactions of animals. The following are the most common methods of standardizing digitalis:

U. S. P. Frog Method: Frogs (20 to 30 Gm. weight) are kept at 20° C and the digitalis to be assayed is injected into the ventral lymph sac, the volume being about 0.015 cc. per Gm., and the alchohol content about 20%. The smallest dose causing systolic standstill of the heart at the end of one hour is the minimum lethal dose. The frogs should be standardized by injections of ouabain which should kill in a

dose of 0.00054 mgm. per gram body weight. If the dose for any lot of frogs differs from this, a corresponding correction should be made in the results of the assay. Digitalis tincture must cause systolic stoppage in a dose between 0.0055 and 0.0065 cc. per gram.

Famulener and Lyon's One Hour Method: The digitalis is injected into several 40 Gm. frogs in varying dose. That amount which paralyzes the heart in one hour leaving it sensitive to stimulation, is the quantity on which standardization is based. Each lot of frogs must be standardized before use by testing them with ouabaine. The result of the test is then compared with this standard, and expressed in units.

Focke's Frog Heart Method: The heart of a normal frog is exposed, the digitalis injected and the time required for the heart to stop in systole is observed. If this is not between 7 and 20 minutes a larger or smaller dose must be given. Four such frogs are weighed after the heart stops, and the averages are taken. The weight divided by the minutes multiplied by the dose in cc. is the standard, and should be about 10 (e.g., weight, 0.30 Gm., dose 0.3 cc.; time, 10 minutes for a 10% infusion.

Reed and Vanderkleed's Guinea Pig Method: Guinea pigs of any size are used, a dose based on that for a 250 Gm. pig and adjusted to the weight being injected subcutaneously in the abdomen. The smallest amount of the preparation which will kill 250 Gm. of guinea pig in 24 hours is the unit. This method as well as the one described above is not very reliable.

Hatcher and Brody Cat Method: A cat is anesthetized and an amount of digitalis less than enough to cause death is injected into a vein. Injection is then discontinued and a standard solution of ouabaine, the value of which is known, is injected until death occurs. The amount, less than 0.1 mgm. per Gm. required, represents the value of digitalis previously given. The amount which would have been required without the ouabaine is calculated by a simple proportion. The test may be modified by giving 0.075 mgm. of ouabaine per kilo, and continuing with the unknown solution until death supervenes, which must take place in 1 to 2 hours after beginning the injection. The quantity which represents the activity corresponding to the additional 0.025 mgm. of ouabaine, is multiplied by four to give the fatal dose, per kilo, which is termed *cat unit*. The cat method of Hatcher and Brody is considered the best. Being a warm blooded animal the cat's heart more closely resembles that of man. It has been proven that investigators working independently in different parts of the country get results that will vary less than 10% assaying samples from the same lot of digitalis by the cat method.

To insure more accurate observations through the use of a digitalis of a known and constant behavior a plan was adopted by the Adult Clinic of Bellevue Hospital and the Department of Pharmacology of Cornell University Medical College. This consists in obtaining a quantity of digitalis leaf sufficient to last for a period of two to three years. It is first standardized by the cat unit method and a sample is tested on several patients to determine its clinical effectiveness. This lot of digitalis leaf is placed in a suitable container sufficient to hold the entire amount. Withdrawals for manufacturing purposes do not exceed a maximum of 10% of the whole amount of the drug. Immediately on withdrawal of a portion of the lot for manufacturing, an equal amount of biologically and clinically standardized digitalis leaf is added to replace the amount withdrawn. After each addition of a new lot the old and the new are intimately mixed. By following this procedure the essential potency of the powdered digitalis leaf remains practically unchanged. At no time can the variation, if any, be more than 10%.

Digitalis is perhaps the only drug in the materia medica concerning whose dosage there seems to be much mystery. This is more apparent than real, for digitalis can be given for varying degrees of heart damage, which naturally requires different doses. Thus in cases where digitalis is to be given for its tonic effect and where digitalization is not an immediate problem it may be given in the form of a powder or tablets in 1.5 gr. doses, or as the tincture in 16 minim doses, three to four times a day.

In cases where digitalization is required there are three methods available: 1. The slow method in which digitalization is obtained in from four to six days; 2. The rapid method in which digitalization is obtained in from one to two days; 3. The intensive Eggleston body-weight method for use in urgent conditions in which digitalization is required in a few hours.

The slow method is used in cases where the

heart is decompensated, but in which no urgency exists. In these cases four doses of digitalis, every four hours during the day, is given. This is done as follows: In form of the tablet, one and a half grains of digitalis is administered from one to three tablets every four hours. In its tincture form the dose is from 16 to 40 minims every four hours. By this method digitalization is obtained in from four to six days.

The rapid method is used in cases which are more urgent and in which digitalization is required in from one to three days. Here the following regime is used: First day, give four tablets (each one and a half grains) of digitalis every six hours for the first twenty-four. This would be equivalent 64 minims of the tincture at each dose. On the second day the dosage is reduced as follows: Two tablets (three grains) or 32 minims of the tincture are given every four hours only during the daytime. From the third day and thereafter until complete digitalization is secured continue with the dosage of the second-day schedule.

In urgent cases where intensive digitalization is required and in which the heart must be completely under the influence of this drug in from 12 to 24 hours mathematical exactitude is required. The total requirements of digitalis for each patient is calculated by one of the following formulas:

Grams of powdered digitalis leaf $= \dfrac{\text{C. U.} \times 0.15 \times \text{w}}{1000}$

Cc. of tincture of digitalis $= \dfrac{\text{C. U.} \times 0.15 \times \text{w}}{100}$

Cc. of infusion of digitalis $= \dfrac{\text{C. U.}}{100} \times \text{w}$

C. U. represents the milligrams of digitalis in a cat unit. Thus one and a half grains of the tablet or 16 minims of the tincture will have this equivalence. W represents the weight of the patient in pounds.

After the patient has been fully digitalized by any of the above methods, the equilibrium which has thus been established may be maintained by the administration of digitalis in sufficient amounts to replace that eliminated by excretion. The average rate of disappearance of the drug from the body is twenty-two minims of the tincture each day. There are of course wide variations from the normal. It is therefore suggested that in order to avoid danger of accumulation, the daily dose should not exceed sixteen minims of the tincture.

Digitalis may be introduced into the body by any one of four different ways: 1. by mouth; 2. by rectum; 3. intravenously and 4. intramuscularly. The greatest quantity of digitalis under ordinary conditions is given orally. However, special occasions may arise which demand another route for administration. These will now be considered.

Rectally. The special circumstances which call for the administration of digitalis per rectum are as follows:

1. In cases of unfavorable position of the cutaneous veins.

2. In severe edema.

3. In cases where there is danger of thrombosis and embolism.

4. In very protracted hepatic congestion.

5. Also for reasons to be enumerated later under conditions for intravenous administration which in addition have one or more of the above complicating factors.

Rectal administration of digitalis was introduced prior to the intravenous administration of this drug. This mode of administration was utilized when the oral method gave rise to vomiting. These first attempts were carried out with either the diluted tincture of digitalis or with the infusion. The results obtained were not very satisfactory. The reason was that these preparations irritated the mucous membrane of the rectum and could not be retained for absorption. When the tincture was diluted to the point where it ceased to irritate, its volume was too large for the purposes in mind. The solution, because of its bulk, was often expelled.

The rectal method of administering digitalis has much in common with the intravenous mode, and results may be obtained in those cases in which the oral method is without results. This is not only so when digitalis produces nausea, but especially in those cases in which it is well borne by mouth, but in which no effect manifests itself. According to Cleotta, it is probable that the favorable results obtained from the rectal administration of digitalis are

due to the fact that the blood from the inferior and middle hemorrhoidal veins leading from the rectum goes directly into the inferior vena cava and thence to the heart.

Digitalis may be given per rectum in several different forms. It is always essential that before any form of digitalis is inserted into the rectum the patient should receive a preliminary cleansing enema. After evacuation, from 8 to 20 cc. of digitan is given by rectal tube and washed through with 25 cc. of tapwater. A rectal tube of small caliber is inserted to a depth of about six inches from the anal orifice. The funnel into which the digitan is poured is held about fifteen inches above the level of the anus. After the tapwater has been allowed to flow in, the tube is clamped, left *in situ* for fifteen minutes, and then slowly withdrawn. The patient is instructed to avoid bowel movement for at least six hours.

Another method of injecting digitan rectally is to use one cubic centimeter of the solution in 10 cc. of water, which is injected into the rectum two or three times daily with a small glycerine syringe.

A digitalis mixture consisting of one gram of powdered leaves of digitalis, 50 cc. of simple syrup, and 150 cc. of water, has been preferred by some. A tablespoonful of this mixture is injected, diluted in a small quantity of warm water, preferably with a small rubber bulb so as to be retained as long as possible. This is repeated three times a day.

The most convenient and probably the most popular method of administering digitalis rectally is the use of suppositories. It has been found that the total dosage required for digitalization per rectum is identical with the amount required when the drug is given by mouth.

Before the suppositories are inserted the patient receives the usual cleansing enema of soapsuds. The first day a rectal suppository of four cat units (six grains) is given morning and night, making a total of eight units or twelve grains. On the second day is given one suppository of four units (six grains) in the morning; this may or may not be followed at night by a suppository of two units (three grains) or by a suppository of four units (six grains), depending upon the individual patient and upon clinical conditions, thus making a possible total dosage for the second day of four, six or eight units (six, nine or twelve grains). On the third and subsequent days are given one suppository of two units (three grains). The Eggleston intensive method of digitalization may be used per rectum, and the dosage is the same as when given orally.

The intravenous route, under certain conditions, becomes the only one advisable or available. Briefly, these may be stated as follows:

1. Gastric intolerance with vomiting.

2. Failure of digitalis to act when given orally in left ventricular failure.

3. Old standing asystole complicated by cirrhosis, ascitis and enlarged liver, constituting a double block which prevents the action of digitalis administered by any other route.

4. The necessity for immediate treatment as in the acute asystole of pregnancy, of overstrain, in the asystole of acute pericarditis or acute myocarditis.

5. In cases of sudden collapse due to organic lesions or acute secondary weakness of the heart in pneumonia and in other acute infectious diseases.

6. In cases where operations along the gastrointestinal tract or upper respiratory tract makes the oral or rectal administration of digitalis inadvisable.

7. In certain cases of arteriosclerosis the stomach distends on the slightest intoxication. In such cases the intravenous route is of great value.

8. In traumatic shock with tachycardia and low arterial pressure the intravenous route is the one of choice.

9. It is also indicated in the beginning of the treatment of an ordinary right asystole. When the peripheral and visceral barriers have been overcome by pleural puncture, puncture of the ascites, purgation and reduction of fluid by a restricted fluid regime, digitalis treatment may be begun by one or two intravenous injections. This has the advantage of acting quickly and with smaller doses. Once the improvement has begun treatment may be continued by mouth.

The contraindications of intravenous digitalis therapy should constantly be borne in mind. These are:

1. In cases where there is danger of thrombosis and embolism.

2. In the terminal stages of asystole. No good can possibly be derived in this condition.

3. In cases were the nitrogen products are much increased in the blood stream (azotemia).

4. In patients with mitral disease with slowing of the pulse and signs of auriculo-ventricular block.

5. In cases of extreme insufficiency of the liver or of the kidneys. Here the excreting powers of these organs are so impaired that the added burden of digitalis intravenously will not prove very helpful.

In general, a digitalis body designed for intravenous injections must meet the following requirements: it must be soluble in water, or at least in a weakly alcoholic menstruum. The tincture is of course not suitable. In addition injectible digitalis must be of uniform activity. It must exhibit a minimum of undesirable side actions; it must not deteriorate rapidly, and it must not irritate the veins into which it is injected.

Several specialized preparations of injectible digitalis are available. Digitan solution suitable for intravenous work comes in ampules each containing 1 cc. (16 minims) of a sterilized, isotonic, aqueous solution, equivalent to 1.5 grains of potent digitalis leaves. Nativelle's crystallized digitaline in the form of 1:1000 solution is used by French physicians in from 10 to 35 drops, diluted with one or two cc. of distilled, isotonic water. Digitalone is a highly purified aqueous solution of digitalis. One cubic centimeter contains 15 minims. Digitos is another standardized preparation of water soluble active principles of digitalis. Cloetta's soluble digitoxin, or digalen is preferred by some. Another injectible digitalis preparation is digifoline which is a water soluble digitalis preparation containing all the digitalis bodies.

Digitalis exerts certain definite actions on the heart. It has the power of slowing the heart rate, and this is due to a depressant action on and lessening of the conductivity both of the nervous, extracardiac element (the vagus) and of the myocardial, intracardiac element (Bundle of His).

Clinically, digitalis may be used almost as a specific in tachycardias and arhythmias, e. g. complete arhythmia and auricular fibrillation. In these cases digitalis finds its greatest worth. It is only of slight use in paroxysmal, nervous or febrile tachycardia.

Digitalis in contraindicated generally in bradycardia and premature contractions. It is absolutely contraindicated where there is a tendency to heart block or in actual heart block.

When digitalis is given to a patient with cardiac insufficiency it has a variable action on the systolic; it may lower, raise or have no effect on it whatsoever. But it always lowers the diastolic pressure. The diuretic action of digitalis is one of its most valuable. It is at once a direct dieuretic through heart tonic action and an indirect dieuretic through renal vasodilator action.

Diuresis produced by digitalis is relatively slow when compared to other diuretics. It begins on the average, 24 to 36 hours after administering the drug and usually continues for several days.

Digitalis is one of our great drugs because it is the greatest physiopathological specific for heart failure that we have. The general indications for digitalis may be thus summarized:

It is indicated in *aortic insufficiency* of whatever type. In the stage of decompensation, of mitral involvement, of impending or definite heart failure digitalis should be given in its fullest doses. Once the stage of compensation has set in the usefulness of digitalis is diminished. It may be continued for a short time in small doses for its vasodilator effect.

In mitral disturbances such as *mitral insufficiency* digitalis gives very effective relief. In *mitral stenosis* where there is but a slight closing of the mitral valves and with no tendency to heart block digitalis may be given with benefit. In those cases where the stenosis is marked and where there is a tendency to heart block digitalis should not be administered.

In *chronic myocarditis* small doses of digitalis over long periods of time (not more than 20 days at a time, however) with intervening pauses of 5 days is of benefit to the patient.

The signs of overdosage of digitalis are well defined. These are: nausea, later on vomiting; fall of heart rate to or below 60; diarrhea; appearance of frequent premature contractions, definite heart block, marked physical arythmia or coupled rhythm; and oliguria.

There has been, for many years, a controversy over the administration of digitalis in pneumonia. Recent experimental evidence has shown that high temperature, such as is found in pneumonia, renders the heart more susceptible to digitalis. For that reason great care must be exercised in using digitalis in large doses for patients with high fever.

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MYOCARDITIS

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"Myocarditis," which etymologically means an inflammation of the myocardium, is the term commonly used to denote any inflammatory or degenerative alteration of the myocardium. Even as the term, "Nephritis," created confusion in our conceptions of the various diseases of the kidney, which result from infection, toxins or vascular disease, and has been the occasion of almost endless discussion in the attempt to adequately distinguish renal disorder of unlike pathology and clinical course, "Myocarditis" has led to confusion in differential diagnosis and to incorrect conceptions of myocardial disease. "Myocarditis," as commonly employed, connotes no pathological or clinical entity. Rather it is a word without pathological significance, including unrelated morphological changes. The designation "myocarditis" is commonly employed to describe those cases of cardiac disease, the examination of which reveals no physical signs of endocarditis, pericarditis, syphilitic aortitis, or congenital heart disease. One unfortunate consequence of this vagueness of nomenclature is the tendency to ignore the importance of myocardial pathology in various types of disease of infective origin.

The symptoms and signs interpreted as diagnostic of myocarditis are not the result of a single etiological factor. They do not rest upon the basis of characteristic morphological change common to all cases diagnosed as myocarditis. The impropriety of the term appears as soon as we undertake to specify the various etiological factors. "Myocarditis," as the term is employed, includes a group of cases properly so named, characterized actually, by acute interstitial changes in the course of various infections which are often followed by the morphological alterations of chronic productive interstitial inflammation with a varying degree of cellular destruction. Unfortunately, the term "myocarditis," as commonly employed, includes a group of cases, non-inflammatory in character. In many instances, in which myocardial change is chronic and progressive, eventually terminating in interstitial fibrosis with cellular destruction, the pathological alteration is not the result of infection or inflammation. This pathological process ensues upon gradual impairment of the blood supply; it is due to progressive arteriosclerosis. The morphological changes are not those of inflammation. Probably most of the cases of cardiac disease occurring in individuals past middle life are due to the insidious onset of degenerative changes which accompany the process of growing old. As descriptive of these morbid processes of the myocardium, the term "myofibrosis" will be employed in this discussion.

One other group of cases is commonly designated as "Myocarditis." Various acute infectious diseases, the rheumatic diseases, pneumonia, scarlet fever, especially diphtheria, produce degenerative changes in the cardiac muscle. These, it is true, are usually accompanied by some interstitial change, although the pathology in diphtheria is probably mainly degenerative. Primary degeneration of the myocardium is often the result of non-inflammatory processes. Various intoxications, phosphorus, chloroform, mushroom poisoning, acute yellow atrophy, beriberi, pernicious anemia, and eclampsia may cause an acute myocardial degeneration. Although the acute infective types of degeneration may be classified, for convenience' sake, with acute myocarditis, since acute degenerative and inflammatory processes are so likely to be coexistent in the course of acute infections, it is misleading to confuse degenerative processes resulting from infection with those resulting from toxic substances, not related to infection. All of the simple degenerative types of myocardial disease, infective and non-infective, tend to prompt repair after recovery from the causative infection or intoxication, with the possible exception of diphtheria, which may leave a permanently damaged myocardium. For many years prior to Romberg's paper in 1893, degeneration of the myocardium in the course of infections had been recognized. Romberg pointed out the presence in typhoid, scarlet fever, and diphtheria of acute interstitial myocarditis in association with acute degenerative processes. Even yet, pathologists are not agreed as to the relative importance of the two processes in diphtheria.

Anatomically, acute myocarditis is characterized by diffuse infiltration of the myocardium, by round cell infiltration and proliferation of the fixed connective tissue cells, accompanied by a variable degree of degenerative change. In

rheumatic fever, Aschoff described a characteristic finding, the so-called Aschoff's bodies which appear as, "Nodular infiltrations of miliary and submiliary size. The foci are made up of large cells, the origin of which, from lymphoid or connective tissue, is not determined. The nodules are situated about the vessels and often possess a necrotic center." Aschoff regards these foci, from which according to his opinion, fibrosis later develops, as specific for rheumatic infection, since their occurrence in rheumatic infection has been often confirmed, while they have been missed in infections which are not rheumatic. Kaufmann says, "These nodules coalesce and become partially or wholly fibrous" and in another connection says, "An essential, insidious chronic myocarditis productiva has been described after rheumatic fever, typhus, and puerperal fever, and is recognized especially by clinicians in association with other infectious diseases such as measles and pneumonia, in children. It is altogether probable that a myocarditis beginning acutely may soon develop a protracted course, so that the occasional relationship of a chronic myocarditis to infectious diseases, in the course of which acute myocarditis is frequent, appears likely."

The progressive inflammatory change just described is simulated by a different process developing from a different cause. Chronic degenerative processes with interstitial fibrosis are common. This is the usual type of heart disease, encountered in communities in which acute rheumatic fever is of infrequent occurrence and syphilis is a minor cause of cardiac disease. The insidious development of coronary arteriosclerosis is accompanied by the myocardial change, cellular degeneration with interstitial fibrosis, which characterizes the arteriosclerotic heart. Gradual restriction of the blood supply, cellular degeneration, proliferation of the connective tissue eventually result in myofibrosis. The rapidity and extent of the process are modified by the development of collateral circulation, and probably by the amount of work imposed upon the heart. Cardiac strain may conceivably produce a condition in which there is a relative ischemia of the heart muscle; the blood supply may be normal for usual work, yet inadequate for long-maintained or frequently repeated severe exertion. The hypertension which exists prior to the development of arteriosclerosis, or with it, provides a factor which increases the tension of the cardiac musculature; creates, upon vessels incapable of adequate response, a greater demand for blood and provides the conditions for myocardial degeneration with ultimate fibrosis. The process of degeneration with subsequent fibrosis is illustrated by the acute morphological alterations which ensue upon thrombosis of a coronary vessel, infarction with degeneration of the tissues involved, necrosis, productive interstitial processes, vascular proliferation originating about the necrosed area, and finally connective tissue replacement of the infarcted area. The myofibrosis of the arteriosclerotic heart has developed much more slowly, without the acute changes, but with similar end-results.

The pathological changes which have been discussed may be summarized thus:

1. Acute, (a) mainly degenerative, infective or toxic; these usually recede with recovery of the patient from the underlying disease, although the degeneration caused by diphtheria (in particular) may produce chronic disease.

(b) mainly interstitial, occurring in many forms of infection; this may be followed by chronic productive inflammation.

2. Chronic, (a) degenerative, usually the result of chronic or acute restriction of the blood supply; this is accurately described as "myofibrosis."

(b) inflammatory, subsequent to acute interstitial myocarditis and characterized by chronic interstitial inflammatory processes with destruction of muscle fibers and proliferation of connective tissue; this is chronic myocarditis.

A principal difficulty in determining the etiology or estimating the nature of the pathology is the tendency to simultaneous occurrence of both types of chronic myocardial change in the same individual. With advancing years, both inflammatory and degenerative factors may be effective in the same individual. To these must be added the factor of cardiac strain, which has already been mentioned. Opinion differs as to the possibility of cardiac damage from strain alone; many hold that the normal heart cannot be damaged by muscular strain, and maintain that strain is an effective cause of myocardial pathology, only in hearts already diseased.

The development and course of myofibrosis

have been well described by Siebeck thus: "The course presents all possible gradations from unrecognizable defects to the severe terminal stages with permanent cardiac insufficiency. There are defects with some impairment of the cardiac function, with dilatation or arrhythmia, which persist unchanged for many years, there are exacerbations after fresh injury, and there are forms of the disease, of gradual development or quickly progressive. In general a diminished resistance to fresh attacks accompanies the impairment, and since life so often involves excessive strain, slight infections or toxic injuries, the development proceeds steadily after the first injury, especially when the vessels are involved at the same time." The clinical differentiation between myocarditis and myofibrosis rests almost entirely upon the history, although middle-age or more advanced years, the presence of hypertension or arteriosclerosis, suggest that symptoms of myocardial disease are due to myofibrosis. Clinical signs and symptoms of the two types of chronic disease are otherwise alike.

Cardiac irregularities frequently occur in the course of myocardial disease and are correctly attributed to these conditions. Ectopic beats, various grades of block, and auricular fibrillation are found in the acute as well as the chronic types. Auricular fibrillation and paroxysmal tachycardia are frequently found, especially in the myofibrosis developing with arteriosclerosis of the coronary vessels. While these common symptoms suggest the presence of myocardial pathology, they do not warrant a positive diagnosis of such a condition. Ectopic beats are often found in the absence of any further signs or symptoms of cardiac disease. These may be toxic or nervous in origin. It is important to avoid conclusions which unduly alarm the patient or lead to unwise restriction of his activities. The irregularity may disappear upon the withdrawal of coffee or tobacco, or it may cease as the patient is relieved of some excessive emotional disturbance. Perhaps, the ectopic beats of middle-aged and older persons are an expression of the "unrecognizable defects" mentioned by Siebeck. Even so, their significance is usually no greater than that of the general "slowing up" of physical vigor which "always comes with the years." Without other signs of cardiovascular disease, the presence of ectopic beats should not be regarded as indicating myocardial disease. Irregularities, vague fleeting pains about the heart, even breathlessness should not be too quickly accepted as evidence of cardiac disease, especially in individuals devoid of other objective signs of cardiac involvement. Attacks of paroxysmal tachycardia or fibrillation, although frequent in the course of myofibrosis or chronic myocarditis of infective origin, may be functional. An auricular fibrillation of some duration is a common event in the course of hyperthyroidism and is often succeeded by restoration of the normal mechanism after thyroidectomy. The significance of an abnormal rhythm is dependent upon the presence or absence of other signs of myocardial damage. Alone these do not warrant the diagnosis of myocardial disease, save in the case of heart-block.

In the course of the monograph of Siebeck, there occurs this sentence, "I recognize a large number of patients in whom through a long time the large heart is the only manifestation of the chronic disease of the myocardium." The view here expressed that the large heart is definitely a manifestation of mycardial disease offers a fair field for discussion. The hypertrophied heart of hypertension often presents, at autopsy, a myocardium grossly normal. Microscopically, scattered areas of myofibrosis may be found; they may be lacking. In either case, they are often insufficient to warrant the diagnosis of disease of the myocardium. It is not yet demonstrated that the dilatation and hypertrophy of the hypertensive heart are always evidence of morphological alteration of the myocardium. The left ventricle undergoes notable enlargement in the course of syphilitic aortitis with aortic regurgitation, yet the question as to the presence of myocarditis in these cases is unsettled. Grossly many such hearts do not show evidence of myocarditis or myofibrosis; by no means are microscopical alterations commonly found, adequate to explain the myocardial failure. In both instances, the myocardium has hypertrophied, without inflammation or degeneration, in response to increased work. Hypertrophy with dilatation proceeds to cardiac failure, in many cases of hypertensive heart disease, and of syphilitic aortitis with aortic regurgitation, without myocardial disease. Cardiac hypertrophy, cardiac dilatation, and cardiac failure, it thus appears, are not invariably

dependent upon morphological change of the myocardium. The assumption that these processes involve myocardial disease is questionable; at least probably incorrect. Rather does it appear that the changes mentioned may and do develop upon a vitalistic rather than a purely morphological basis. Under constant demand for increased work due to hypertension or aortic regurgitation, the muscle hypertrophies, eventually dilatation with failure supervenes, upon the basis of physiological, rather than pathological, alteration of the muscle. When morphological change is present, it is probably vascular in origin, due to progressive arteriosclerosis of the coronary vessels in hypertension or to partial stenosis of the coronary openings produced by extension of the syphilitic process to the coronary vessels at their origin.

There are a few clinical signs of importance in the recognition of myocardial disease which are generally known, but often overlooked. Weakening of the cardiac tones, especially the first, gallop rhythm and pulsus alternans are presumptive signs of myocardial disease. Gallop rhythm occurs in different conditions, which are not equally ominous, yet its presence is usually indicative of severe cardiac damage. Frequently the discovery of gallop rhythm in a hypertensive heart gives warning of impending failure. It may occur with the cardiovascular failure associated with severe infectious diseases. The pulsus alternans is almost confined to the failing heart of hypertension; the recovery phase of the cardiac cycle is incomplete and perhaps prolonged; alternate beats are strong and weak, yet separated from each other by a normal time interval.

Weakening of the first heart sound, especially at the aortic area, is a valuable sign of myocarditis or myofibrosis. When this sign is unaccompanied by cardiac failure of the congestive type, its significance as an indication of morphological change of the myocardium is increased. The electrocardiogram is of equal and like value. Given a patient without circulatory failure, the electrocardiogram will, in most cases, permit a diagnosis of anatomic change of the myocardium if such is well established. Early morphological change may be missed. The gross changes of the electrocardiogram which signify myocardial disease may occur as the result of failure of function, especially where this is pronounced. It is not uncommon to find a badly deformed electrocardiogram obtained at the height of an attack of decompensation succeeded by records showing notable improvement after rest and digitalis. This does not forbid the conviction that the electrocardiogram is of particular value in confirming the diagnosis of pathological processes in the myocardium. Yet it must not be overlooked that similar electrocardiographic changes may be due to toxic substances; drugs and various intoxications, such as uremia, as well as the pressure of tumors upon the vagus, especially the right vagus, may produce abnormal electrocardiograms indicative of gross myocardial change.

This brief discussion of a few features of myocarditis may be summarized thus:

1. There are significant differences of etiology and pathogenesis amongst the numerous cases diagnosed as "myocarditis." These may be differentiated and more accurately classified as: acute degenerative processes, myocarditis, acute and chronic, and myofibrosis.

2. Functional alterations are of importance in the production of many symptoms which we loosely attribute to "myocarditis." Cardiac failure may occur in hearts which, anatomically, will show only slight morphological changes, inadequate to explain the failure of the myocardium. Cardiac failure presents a vitalistic aspect, an alteration of function, which is not always accompanied by morphological alteration.

3. Attention has been called to signs long known, but often overlooked, partly because our attention is so predominantly directed to murmurs, arrhythmia, and cardiac size.

30 North Michigan Avenue

THINGS NOT TO WORRY ABOUT

"I wonder why folks worry. There are only two reasons for worry. Either you are successful or you are not successful. If you are successful there is nothing to worry about; if you are not successful there are only two things to worry about. Your health is either good or you are sick; if your health is good, there is nothing to worry about; if you are sick there are only two things to worry about. You are either going to get well or you are going to die; if you are going to get well there is nothing to worry about; if you are going to die there are only two things to worry about. You are either going to heaven or you are not going to heaven; if you are going to heaven there is nothing to worry about; and if you are going to the other place you'll be so damned busy shaking hands with your old friends you won't have time to worry—so why worry?"—*Wisconsin Pharmacal News.*

Society Proceedings

WARREN COUNTY

The first of a series of twelve meetings sponsored by the American Academy of Pediatrics in conjunction with the Illinois State Medical Society, was held at the Monmouth Country Club on Friday, July 28, 1933, with the Warren County Medical Society acting as host. The Meeting began at 2:00 P.M. and with an intermission for dinner at 6:00 P.M., continued until late in the evening.

The program was arranged by Dr. Clifford G. Grulee, of Chicago, and consisted of six interesting phases of infant and child care, and was followed by a "Question Box," with Dr. Grulee answering all questions asked by the many guests at the meeting.

Program.

1. "Infant Feeding." H. N. Sanford, Chicago.
2. "Behavior Disturbances." Bert I. Beverly, Chicago.
3. "General Treatment of Children." C. K. Stulik, Chicago.
4. "Care of the New Born." A. H. Parmelee, Oak Park.
5. "Preventive Medicine." Robert H. Graham, Aurora.
6. "Allergy." W. L. Crawford, Rockford.
7. "Question Box." Clifford G. Grulee, Chicago.

A short dinner program was given with the principal address by Dr. C. G. Farnum, First Vice-President, Illinois State Medical Society, of Peoria. Illinois has been divided into twelve districts for these meetings, and this was the first of the series to be given during the late summer and early fall, and the program was truly a Post Graduate course in Pediatrics.

There were approximately 135 in attendance, and these guests came from more than twenty-five different counties of Western Illinois and Eastern Iowa. The Peoria Medical Society was well represented by fifteen members, twelve were present from Burlington, Iowa, and a similar number from Galesburg, six from Keokuk, Iowa, and Davenport, eight from Macomb, and fourteen were present from Rock Island County. Every one of the twelve counties in this district was represented by one or more guests, showing the unusual interest in the meeting.

Each presentation was thoroughly discussed by many of the guests and many questions were asked of the speaker throughout the meeting. Dr. Ralph Graham, President of the Warren County Medical Society, was the presiding officer for the entire meeting.

It was the general opinion of all who attended this interesting meeting that this was one of the best programs they have ever heard, and much credit is due to Dr. Grulee, and the American Academy of Pediatrics for starting the interesting series of meetings to be held throughout Illinois. The Educational Committee of the Illinois State Medical Society through its Secretary, Miss McArthur, assisted materially through many press reports which appeared in all papers in this section of the State, as well as in Eastern Iowa.

The Warren County Medical Society had a 100% attendance during the day, and wishes to thank the many visitors, some of whom came 150 miles or more to enjoy the meeting, for their cooperation.

Chas. P. Blair, M.D.
Secretary.

Marriages

CLIFFORD L. CARTER to Miss Astrid Nygren, both of Chicago, June 7.

CHARLES WESLEY EISELE, Naperville, Ill., to Miss Blanche Mae Kennell of Rochester, Ind., June 15.

LOUIS JOSEPH HALPERN, Chicago, to Miss Gertrude Jenne Epstein of Danville, Ill., June 10.

THOMAS J. MERAR, Quincy, Ill., to Miss Iva Russakov of Chicago, June 18.

Personals

Dr. Edward S. Judd, Rochester, Minn., was the principal speaker before the recent annual meeting of the Lee County Medical Society, on cholecystitis.

Dr. Loyal Davis was the recipient of an honorary degree of doctor of science from Knox College, Galesburg, Ill., at its annual commencement.

Dr. Fred M. F. Meixner, Peoria, addressed the La Salle County Medical Society at Harding, June 7, on "Clinical Aspects of Childhood Tuberculosis."

Dr. Paul M. Hardinger, Mattoon, spoke on medical and surgical treatment of cataract before the Coles-Cumberland Medical Society, July 6.

Dr. Philip H. Kreuscher, Chicago, conducted a crippled children's clinic at Sterling, July 11, and one at Monmouth, July 12, under the auspices of the Whiteside and Warren county medical societies.

Dr. Ralph A. Goodner, Nashville, has been appointed managing superintendent of the

Anna State Hospital; he occupied the same position in 1913.

Dr. Philip H. Kreuscher has been appointed medical director of the Industrial Commission of Illinois. It was also announced that the organization of a medical department is planned, to facilitate impartial administration of the workmen's compensation act.

Dr. William F. Dickson was honored at a dinner, June 29, and presented with a desk set by the staff of the Woodlawn Hospital, on the occasion of his completion of fifty years in the practice of medicine. Dr. Rollo K. Packard, president of the hospital, presided.

News Notes

—The state supreme court refused a rehearing, June 9, to W. H. H. Miller, former director of the state department of education and registration, according to the Chicago *Tribune*, June 10. Miller had been convicted of operating a diploma mill and had served his sentence and paid his fine, but the appeal was an attempt to clear his record.

—Mr. John J. Hallihan has been appointed director of the state department of registration and education, succeeding Mr. Michael F. Walsh, and Eugene R. Schwartz as superintendent of registration, replacing Mr. Paul B. Johnson. Mr. Stanley Kiflewsky, Chicago, succeeds Mr. J. E. Edwards as chief inspector.

—Dr. Eben J. Carey, professor of anatomy, Marquette University School of Medicine, Milwaukee, lectured in the Italian Pavilion of the Century of Progress, July 9, on "The Italian Fathers of Basic Medical Science." This lecture was one of a series of cultural lectures on Italian achievements in science, fine arts, literature and politics, being presented under the supervision of Prof. Enrico Bompiani of the University of Rome. Dr. Carey is in charge of medical exhibits for the exposition.

—A series of one day lecture courses in pediatrics, to be held in eleven districts of Illinois, under the auspices of the American Academy of Pediatrics and the education committee of the state medical society, was inaugurated in Bloomington, McLean County, July 13. The most recent information on problems concerning the care of children and the prevention of childhood diseases will be discussed in these courses, the second of which opened July 22, in Warren County.

—On his retirement as president of the Chicago Medical Society, June 21, Dr. Herman L. Kretschmer presented a silver cup to the Chicago Medical Society to perpetuate the memory of Dr. J. Warren Vanderslice, who died, Dec. 24, 1932. The winner of an annual golf tournament will have his name inscribed on the cup and may keep it for one year. Physicians eligible for the competition will be the officers and trustees and past presidents of the Chicago Medical Society and members of the council and officers of the branches of the society. The game is to be played between the annual election and Labor Day and will be arranged by a committee consisting of the president-elect, secretary and three members of the council.

—Dr. Ludvig Hektoen retired as professor of pathology, Division of Biological Sciences, University of Chicago, July 1, becoming professor emeritus. Dr. Hektoen, who is 70 years of age, has been professor and head of the department of pathology at the university since 1901. From 1895 to 1898 he was professor of morbid anatomy at Rush Medical College. Since that time he has been professor of pathology at the college. He occupied a similar position with the College of Physicians and Surgeons of Chicago from 1892 to 1894. Dr. Hektoen has been director of the John McCormick Institute for Infectious Diseases since 1902 and editor of the *Journal of Infectious Diseases* since 1904 and of the *Archives of Pathology* since 1926. He was three times chairman of the division of medical sciences of the National Research Council. Societies of which he has been president include the Chicago Medical Society, 1919-1921; Chicago Pathological Society, 1898-1902; Association of American Pathologists and Bacteriologists, 1901; Society of American Bacteriologists, 1929; Society of Immunologists, 1927; Institute of Medicine of Chicago, 1929. In 1909 he was vice president of the American Association for the Advancement of Science and for several years has been chairman of the Committee on Scientific Research of the American Medical Association.

—An informal program marked the dedication of the new $3,000,000 Provident Hospital

and training medical center for Negroes, June 1, although it had been open for business since May 15. Mr. A. L. Jackson, president of the board of trustees, presided, and speakers included Mr. Edwin R. Embree of the Julius Rosenwald Fund; Col. Albert A. Sprague; Dr. Henry S. Houghton, director of the University Clinics; Dr. Franklin C. McLean; Mrs. George Cleveland Hall, president of the woman's auxiliary board of the hospital, and Admiral Norman J. Blackwood, medical director. The institution is located in the remodeled building of the old Chicago Lying-In Hospital on Fifty-First Street. Previously it had been operating more than forty years at 16 West Thirty-Sixth Street. The training center is the outgrowth of an agreement entered into between the Provident Hospital and the University of Chicago in 1930, with the objective of improving the standard of medical practice and nursing among the colored race. Preference in appointments is to be given to colored physicians, although individual appointments are to be determined only on personal and professional qualifications regardless of race. About $1,250,000 was used for the purchase and remodeling of buildings formerly occupied by the Chicago Lying-In Hospital. The gift of $1,000,000 by the General Education Board of the Rockefeller Foundation will be administered by the University of Chicago for teaching purposes in the hospital, and the remainder of the fund will be used for endowment and equipment. Dr. Blackwood will continue as medical director, a position he has held since April, 1930.

The Madison County Medical Society met at Beverly Farm July 7, 1933. It was addressed by Dr. Archie D. Carr on the subject of "Organic Diseases of the Brain." After discussion of Dr. Carr's paper, the business of the society was taken up.

The question of emergency relief was pre- of the Society that a definite plan be formulated sented by Dr. G. B. Smith and it was the sense and submitted to the Society at a later date for adoption. It is hoped by this process to eventually correlate all relief agencies within Madison County.

Delightful refreshments were served by Dr. and Mrs. Smith.

Deaths

JOHN BENNETT, Ava, Ill.; Missouri Medical College, St. Louis, 1898; aged 63; died, June 19, of heart disease and diabetes mellitus.

JOSEPH HOWARD CAMPBELL, Bismarck, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1902; served during the World War; aged 60; died, May 30, of coronary sclerosis.

HERMANN P. A. CARSTENS, Forest Park, Ill.; Bennett Medical College, Chicago, 1912; a Fellow, A.M.A.; aged 61; died, June 11, of coronary thrombosis and chronic myocarditis.

HARRY CONVERSE, Carrollton, Ill.; Missouri Medical College, St. Louis, 1886; aged 68; died suddenly, June 23, of cerebral hemorrhage.

EDWARD LE MOTTE EUSTICE, Kewanee, Ill.; Chicago College of Medicine and Surgery, 1916; member of the Illinois State Medical Society; aged 51; on the staffs of the Kewanee Public Hospital and St. Francis' Hospital, where he died, June 25, of peritonitis, following an operation for appendicitis.

CLAYTON E. FAWCETT, Aurora, Ill.; Hahnemann Medical College and Hospital, Chicago, 1905; aged 55; died, June 22, in the Copley Hospital, of acute myelogenous leukemia.

GARRETT FITZGIBBON, Chicago; Rush Medical College, Chicago, 1889; a Fellow, A.M.A.; aged 76; died, June 3, of carcinoma of the gallbladder.

EARL GREEN, Mount Vernon, Ill.; Bellevue Hospital Medical College, New York, 1884; aged 72; died, June 3, in the Mount Vernon Hospital, following a prostatectomy for prostatic hypertrophy.

WILLIS FRED HARVEY, Rushville, Ill.; College of Physicians and Surgeons, Keokuk, Iowa, 1897; member of the Illinois State Medical Society; past president and secretary of the Schuyler County Medical Society; served during the World War; formerly county coroner; aged 63; died, June 18, of chronic myocarditis.

ABRAHAM L. JOHNSON, Prophetstown, Ill.; Rush Medical College, Chicago, 1891; aged 68; died, June 16, of coronary thrombosis.

CALVIN GRIFFITH MCCULLOUGH, Chicago; Starling Medical College, Columbus, Ohio, 1883; aged 71; died, July 4, of cerebral hemorrhage.

EDWIN MCGINNIS, Chicago; Northwestern University Medical School, Chicago, 1904; a Fellow, A.M.A.; assistant clinical professor of laryngology and otology, Rush Medical College; secretary of the American Bronchoscopic Society; member of the American Academy of Ophthalmology and Oto-Laryngology, the American Laryngological Association and the American Laryngological, Rhinological and Otological Society; fellow of the American College of Surgeons; on the staffs of the Chicago Municipal Tuberculosis Sanitarium, Presbyterian Hospital and the Children's Memorial Hospital, the Veterans' Administration Hospital, Hines, and St. Francis' Hospital, Blue Island, Ill.; aged 55; died, July 1, of angina pectoris, in Muskegon, Mich.

JOHN JOSEPH MEANY, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1900; a Fellow, A.M.A.; Fellow of the American College of Surgeons; attending surgeon to the West Suburban Hospital, Oak Park, Ill.; aged 54; died, June 7, of angina pectoris.

WILLIAM T. MEFFORD, Riverside, Ill.; Cincinnati College of Medicine and Surgery, 1874; a Fellow, A.M.A.; Medical College of Ohio, Cincinnati, 1880; aged 80; died, May 17, of uremia and chronic nephritis.

ORLEY H. MURPHY, Lincoln, Ill.; Chicago College of Medicine and Surgery, 1917; aged 65; was killed, May 19, in an automobile accident.

FRANK EMIL NAGEL, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1900; a Fellow, A.M.A.; acting assistant surgeon, U. S. Public Health Service; aged 57; died, June 20, in the U. S. Marine Hospital, of acute appendicitis and diabetes mellitus.

WILLIAM SYLVESTER ROYCE, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, Chicago, 1897; a Fellow, A.M.A.; on the staff of the Westside Hospital; aged 70; died, June 8, of cerebral hemorrhage and diabetes mellitus.

JAMES D. SMITH, Benton, Ill.; American Medical College, St. Louis, 1879; member of the Illinois State Medical Society; aged 94; died, May 19, of an injury to the hip.

JAMES W. SMITH, Cutler, Ill.; Missouri Medical College, St. Louis, 1881; aged 79; died, June 4.

ARTHUR B. STURM, Oak Park, Ill.; Rush Medical College, Chicago, 1899; aged 58; died, June 16, of cerebral hemorrhage.

GEORGE FRANCIS SUKER, Chicago; University of Michigan Medical School, Ann Arbor, 1892; a Fellow, A.M.A.; Chairman of the Section on Ophthalmology, American Medical Association, 1930-1931; member of the American Academy of Ophthalmology and Oto-Laryngology; fellow of the American College of Surgeons; on the staffs of the Post-Graduate Hospital, Cook County Hospital, Grant Hospital and the Edward Hines, Jr., Hospital, Hines, Ill.; aged 63; died, July 2, of coronary sclerosis.

EUGENE PATRICK SULLIVAN, Morrison, Ill.; Rush Medical College, Chicago, 1899; member of the Illinois State Medical Society; served during the World War; aged 59; died, June 28, in the Jackson Park Hospital, Chicago, of pneumonia, as the result of injuries received in a fall.

CARL G. SWENSON, Chicago; Rush Medical College, Chicago, 1891; an affiliate Fellow of the American Medical Association; associate professor of (extramural) surgery, Northwestern University Medical School; fellow of the American College of Surgeons; veteran of the Spanish-American War; on the staff of the Passavant Memorial Hospital; aged 77, died, July 8, of pneumonia.

WILLIAM OSCAR WARREN, Carlyle, Ill.; St. Louis University School of Medicine, 1915; a Fellow, A.M.A.; served during the World War; aged 42; was found dead, May 30.

CHARLES R. WELLS, Wauconda, Ill.; University of Michigan Medical School, Ann Arbor, 1866; aged 88; died, May 6, at Crystal Lake, of myocarditis.

THEODORE MARTIN WIERSEN, Chicago; Bennett College of Eclectic Medicine and Surgery, Chicago, 1906; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1908; aged 55; died, June 1, of hemorrhage due to carcinoma of the stomach.

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